The Iron Age

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The Construction and Management of Roll Trains for the Manufacture of Heavy Bars, Rails and Girders.

BY WILLIAM HEWITT, M. E.

PART III.—*The Three High Mill.*

(Continued).

The first "mechanically yielding guides" were used on a vertical "three-high" beam mill at the Trenton Iron Works, Trenton, N. J., now the New Jersey Steel and Iron Works. [*Note.*—These guides are generally known simply as "yielding guides," but as the ordinary guides are also yielding, or should be, by virtue of their own weight, we use the above expression to make the designation more distinct. There is really no invention in the device after all, for they are merely ordinary guides made yielding by mechanical means.] The mill to which they were applied, was the first "three-high" beam mill in America, and supposed to be the first ever erected, with the exception of the one at Auzin, before referred to. The accompanying engraving of this mill illustrates its arrangement in all the details with the exception of the guides, which are not shown, as the original drawing, from which the figure here presented was engraved, was made before they were applied. We observe, by inspecting the figure, that the mill was very similar to the ordinary "three-high" mill of to-day turned on end, and in the friction rollers at the top it resembled somewhat the present universal mill. This peculiar arrangement was adopted with the idea of reducing the lift from the lower to the upper grooves, but it necessitated placing the driving gear so deep underground that it made it very awkward to get at in case anything needed replacing or repairing. The mill was worked for ten years, however, and then abandoned, and replaced by a horizontal "three-high" mill. The first guides used on this mill were screwed rigidly against the rolls, and acted as cutting tools (which might have been foreseen), either to the beam or rolls themselves, according to their degree of tightness against the rolls. A happy medium of pressure was sought for, at which the guides would just cut neither the roll nor the beam, but as this point was continually varying, no end of difficulties were experienced until the idea suggested itself of placing springs against them, and so causing them to yield with the rolls. This was done in 1854, three years after the mill was erected. This may seem but a simple device, but yet it was a great discovery, for it established the complete efficacy of the "three-high" mill for the purpose desired, enabling us to produce heavy bars and plates of iron with an economy of time and labor unprecedented.

By referring to the Patent Office report for 1858 we will find a patent taken out by Mr. John Fritz, of Johnstown, Pennsylvania, in which he claims, "the so arranging of 'three-high' rolls for railroad rails, bars or beams, so that said rails, bars or beams may be rolled or reduced as they pass both forward and back, and so that each succeeding pass shall roll down the fin formed at the preceding pass, and avoid any necessity of turning the bar as heretofore done. And, also, in combination with the top roll of the series, or of any roll of a series which performs its duty, the yielding clearer or guide, or its equivalent, for preventing the bar, rail or beam from winding on the roll." Mr. Fritz has mistaken a discovery for an invention, and one which was made at Trenton four years before he obtained a patent for it. Its value was at first hardly realized, but it is now fully appreciated, and Mr. Fritz has (in ignorance of the fact with regard to the mill at Trenton) had conferred upon him the honor of "the inventor of the large 'three-high' mill," which justly does not belong to him. We mention it not in the least to disparage the ingenuity of Mr. Fritz, but to correct a false impression.

The most recent improvement in the "three-high" mill is the fixed middle roll. In the common arrangement the bottom roll is fixed and the top and middle ones adjustable by wedges immediately beneath their carriers, as in the ordinary "two-high" mill. This is all right for the downward pressures on the middle roll, which are transmitted directly to the housings, but for the upward pressures on this roll it is very objectionable, because they have to be transmitted through the upper chucks and journals of the top roll before reaching the housings, which must eventually receive all the pressures. The riders and carriers of the top roll therefore, in the latter instance, act as brakes to the journals of the top roll, which, rotating all the while, are consequently subjected to an undue amount of friction. The idea of making the middle roll fixed and the top and bottom one adjustable, was first carried into effect at the Trenton Iron Works in 1861, on the mill which replaced the old vertical mill. The chucks of the middle roll were securely fastened in the housings, and the top roll was adjusted in the usual manner by the screws in the caps of the housings, but the bottom roll was adjusted by peculiarly arranged wedges, through which screws worked lengthwise, the position of these screws remaining the same, so that by turning them one way or the other the wedges were moved backward or forward and the roll raised or lowered as desired. These screws were so connected with the screws in the caps of the housings that the motions of the top and bottom rolls were equal and simultaneous. Mr. Henry Burden, of Troy, while visiting Trenton, had occasion to inspect this mill shortly after the adoption of this arrangement, and on returning to Troy, constructed one on the same principle, but discarded the complicated mechanism for adjusting the bottom roll, and substituted in its stead large screws which, working through nuts in the bottoms of the housings, were similar in every respect to those for adjusting the top roll. These screws were also, as in the other case, so connected with each other that their motions were equal and simultaneous. This arrangement has not yet been generally adopted, but it is destined not long hence to become the common practice, as by it each chuck sustains only the weight and strain on its own roll. We believe that Mr. John Fritz has since constructed a mill at Bethlehem, which is substantially the same as Mr. Burden's, but with a few slight improvements added. Instead of the usual system of water pipes for lubricating the roll journals, which must all be taken down to change rolls, the water passages are formed in the brasses, and a hydraulic crane for changing rolls travels back and forth on the shoes. For a more complete description of his arrangement we would refer the reader to the *Engineering* of June 12, 1874.

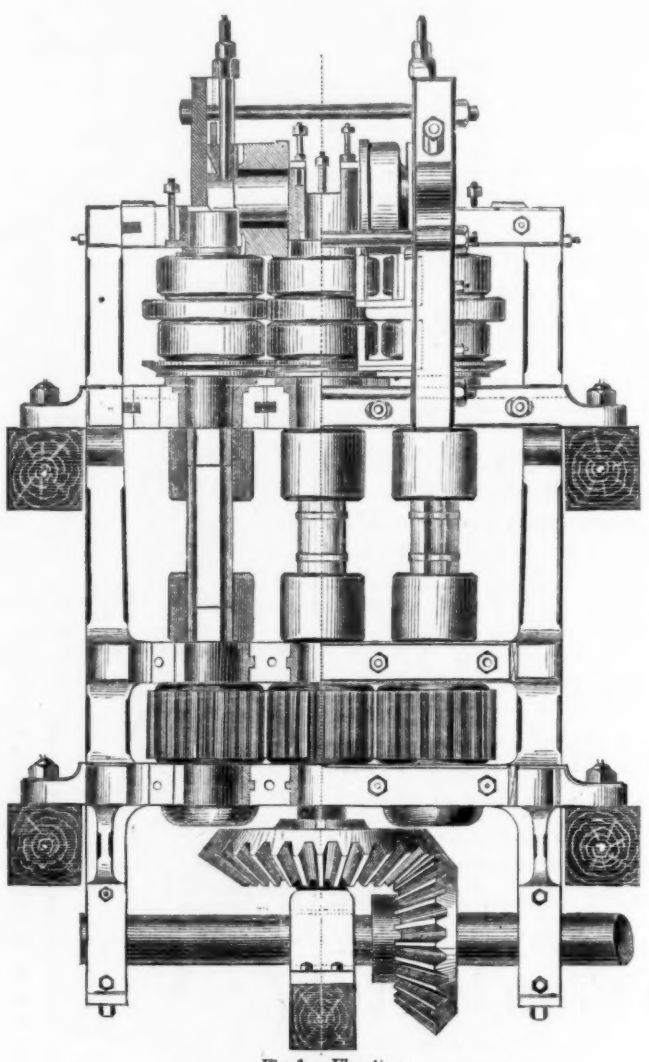

Fig. 1.—Elevation.

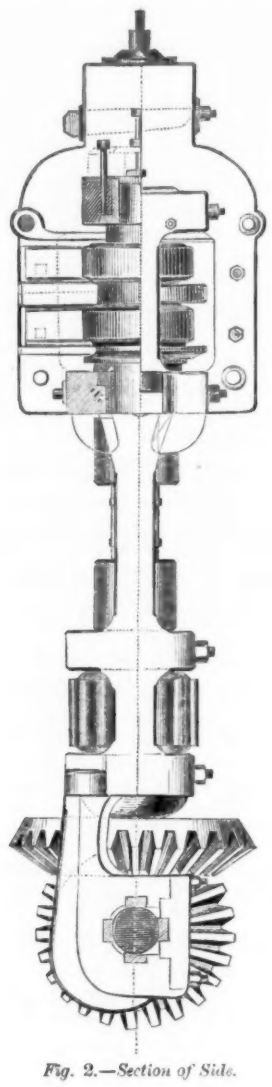

Fig. 2.—Section of Side.

THREE-HIGH BEAM ROLLING MILL AT THE TRENTON IRON WORKS.

PART IV.—*The Reversing and Universal Mills.*

The system of reversing the rolls after each passage of the bar between them has been adopted in many mills in various parts of the world, but more especially in England, where it has become the common system.

Its invention is claimed by Mr. Thomas Ellis, of the Tradegar Iron Works, Monmouth, in a patent taken out in England in 1851. According to the description of this invention, given in the *Mechanics' Magazine* (vol. 55, 1851), "Mr. Ellis' improvements consist in causing the rolls to have a motion first in one direction and then in the other, so that the bloom of iron, after being once drawn through the rolls, may be returned through them in the opposite direction; and this operation may be repeated until the bloom shall have been sufficiently rolled. For this purpose, the ends of the rolls are furnished with pinions, which are geared into and actuated by racks, which are connected to a crank by a suitable connecting rod in such a manner that the revolution of the crank may cause the racks to be moved backward and forward, and, through them, the rolls to revolve alternately in opposite directions. The blooms, after having been sufficiently rolled, may be manufactured in the ordinary manner into bar or plates for railway and other purposes. The same principle of causing the rolls to move alternately in opposite directions, may be also applied to the rolling of bars and plates of iron, care being taken that the throw of the crank, the length of the rack, and the size of the pinion shall be so regulated as to cause the roll to pass over a space of greater length than that of the metal operated on."

Mr. Ellis only applied his invention to the blooming train in the puddle mill, where the motion of the rolls is required to be very slow, but we see by the description given that its application to the more rapid rolling operations was already anticipated.

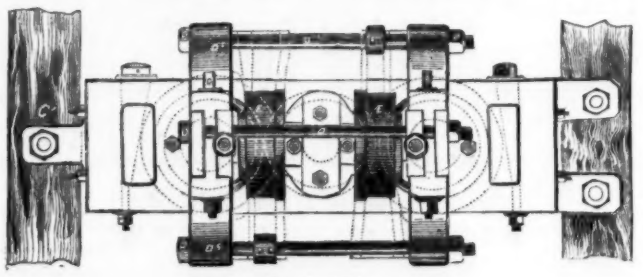

Fig. 3.—Plan.

Messrs. F. C. & C. E. Winky, of Cardiff, attempted to revive this idea of reversing the rolls by the reciprocations of a long rack bar, in 1865. Their mill was merely a slight improvement on Mr. Ellis' arrangement, the power being applied directly to the rack bar which moves the rolls, and either steam or hydraulic power being used, according to whichever was most convenient. The arrangement was rude, however, and never met with any great favor.

"The common method of reversing the rolls at present is effected by means of five spur wheels, two of which are on the same axle and run in opposite directions. To each of these wheels is attached a clawed clutch, the claws of which are placed in opposite directions; and into these claws is moved alternately a clutch, which slides upon feathers fixed to or forged on the main shaft. The center is moved into either of the side clutches before the plate or bar is allowed to enter the rolls, and at the time of entrance (of the clutch) the side clutches are moving at full speed, while the center clutch and rolls are stationary. The center clutch is usually moved into position by hand; it may be done with advantage either by steam or hydraulic pressure. The rolls being stationary, their starting must be effected by means of a blow, the violence of which will depend upon the speed of the clutch, weight of the fly-wheel, gearing and rolls. The ordinary speed of such a mill may be taken at 25 revolutions per minute. There are several mills with rolls of about 22 inches diameter, reversing at 35 revolutions per minute; but these mills are very liable to accident, in consequence of the great shock caused by throwing in the clutch while the wheels are at full speed, the rolls being in a state of rest."—(Modern Appliances for Reversing Rolling Mills—by Mr. B. Walker.—*Journal of the Iron and Steel Institute*, May 1, 1871).

Several suggestions have been made for removing this sudden shock, and numerous devices for this purpose patented; but it would be futile to attempt to describe them all. We would refer those, however, who are anxious to study up the subject, to the *Journal of the Iron and Steel Institute*, of Great Britain, for May, 1871, and for August, 1872; the *Engineer* of May 13, 1870 (page 290); the *Engineering* of August 3, 1866, of May 9, 1873, and of March 13, 1874. The number of clutches designed for reversing rolling mills is endless; and all of them possess more or less merit. One system alone is independent of a clutch, and that is so ingenious, and has met with so much favor, that we would be very much at fault if we omitted to consider it.

This system dispenses altogether with the fly-wheel, and makes the boiler the reservoir for the reception of all shocks, and thus by reversing the engines the rolls are reversed at will, and without strain upon the mechanism of the train. The idea was first suggested by Mr. Nasmyth, but Mr. Ramsbottom, of Crewe, was the first to work it out and apply it. Mills on this system can be so constructed that whatever may be the size of the rolls and speed, they can be reversed. The reversing motion is of the ordinary locomotive type, but instead of the reversing lever, Mr. Ramsbottom uses a small hydraulic cylinder, and for this contrivance he holds a patent. The labor required for reversing these engines is very small, it being only necessary to move a small valve coupled to this hydraulic cylinder. The arrangement of the handles of the steam and the hydraulic valve is such as to place the speed and reverse of the engines under ready control of the workman. "In this plan the rolls at each reverse start from a state of rest, the speed increasing as the steam comes to the engines, thus avoiding the shock caused by reversing the rolls with a clutch at full speed without any elastic medium. The sudden stopping of the rolls and the engine is effected by reversing the valve, and thus bringing the steam to the other side of the piston. Experience has proved that although the engines may run at a very high speed there is no very violent shock in stopping, the steam acting as a cushion. Mr. Ramsbottom's system does not admit of a fly-wheel, and the steam cylinders must be so large as at once, without any momentum of fly-wheel, to roll the plate or beam. Mr. Ramsbottom deserves great praise for the manner in which he has developed this system of rolling mills, it being well known that he stood comparatively alone in the belief that plates could be rolled without the aid of a fly-wheel. And at the time of construction of his first pair of engines, forgemen repeatedly affirmed that for once he would fail. The wheels used by Mr. Ramsbottom for driving the rolls were—as 7: 18—rolls of 24 in. diameter, 6 ft. in length, and with the piston going at its usual speed of 378 ft. per minute. The circumferential speed of the rolls therefore was about 125 ft. per minute, and the number of revolutions 21."—(Modern Apoliances for Reversing Rolling Mills.)

At the meeting of the Iron and Steel Institute of Great Britain, May 11th, 1870, Mr. Waker stated, that, "with regard to Mr. Ramsbottom's system, there is this difficulty—a waste of power in having to stop the engine every time. If it was bad to have to reverse the rolls, he thought it must be worse to have to reverse the engines. When the rolls were reversed by means of hydraulic power, and the fly-wheel removed, the friction was gentle and there was no shock whatever, but when the engine was reversed, steam had to be put on to the piston to get it to go. In the other case there was a certain amount of oily pressure on the clutch, consequently there was no difficulty in starting the rolls from a state of rest."—(*Engineer*, May 13, 1870).

If the steam cushion which receives the shock were made self-contained within the clutch of the common system of reversing the rolls, instead of within the cylinder of the engine, as in Mr. Ramsbottom's system, we would have a mill that would possess all the advantages of both systems. Such a clutch has never been constructed that we are aware of, but one might evidently easily be devised.

However excellent this system may be we would not be guilty of advocating it, because we believe it to be founded on a wrong principle. The very idea of reversing, in itself, is repugnant to us as being unnatural, and in direct antagonism to the law of inertia. It is a harsh method of accomplishing the object sought to be attained, and must eventually, as time rolls on and science progresses, become a thing of the past.

The Universal Mill.—This derives its name from the facility which it affords for rolling different widths and thicknesses with the same set of rolls. Mr. Isaac Dreyfus, of Paris, claims to be the inventor of this mill, but we think that he was anticipated by Messrs. Hartupee and Alexander of this country.—(*See the Engineer, June* 14, 1861, *and the Patent Office Report for* 1863, *page* 176). "This mill," as described in the *Engineering*, of May 24, 1867 (as the invention of a Mr. Wagner), "consists of two horizontal rolls, mounted and geared in the usual way. To these is added a pair of vertical rolls, fixed in bearings which can be traversed on slides in a horizontal direction by means of a pair of right and left screws. The simultaneous movement of the two screws is obtained by a hand wheel geared to a vertical spindle carrying two worms. These worms act upon wheels, keyed on to the screw spindles. By turning these spindles the two vertical rolls are brought closer together, or removed from each other, and by these means the width of the bars to be produced in the mill can be fixed at will. The vertical rolls obtain their motion from the driving pinion, by means of a pair of bevel wheels geared into another pair of bevel wheels which slide on their shaft following the movements of the vertical rolls. Each of the last-named bevel wheels is cast in one with a spur wheel gearing into a pinion of sufficient width to allow for its movement in the different positions given to the vertical rolls. The horizontal top roll is held up in its bearings by a pair of counterweights, and its distance from the bottom roll is regulated in the usual way by a pair of set screws. There are several rolling mills of this kind in operation in France and Austria, and have proved very useful and convenient in practice."

An improvement on the arrangement just described would be, to make the bottom roll serve as a counter weight for the top one, instead of using separate weights for this purpose. This can be done without its interfering in the least with the other functions of this roll, as we shall demonstrate further on, when we come to describe a device of this kind applied to the "three-high" mill. It certainly would make a more compact and convenient arrangement.

This mill, however, is confined almost entirely to the rolling of flat bars and girders, and, although it may answer admirably for these and other bars of symmetrical sections, yet it can never come into competition with the "three-high" and reversing mills, on account of its limited application.

(To be continued.)

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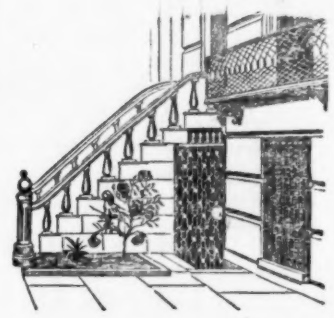

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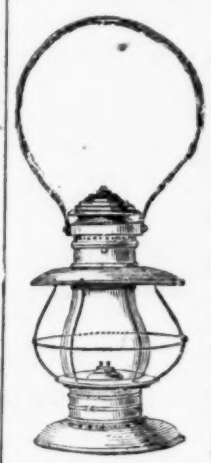

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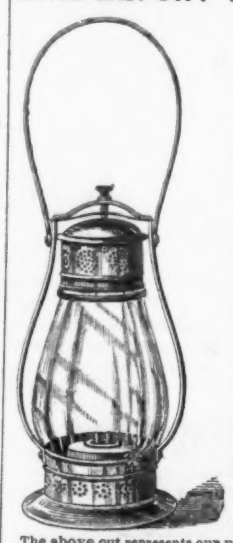

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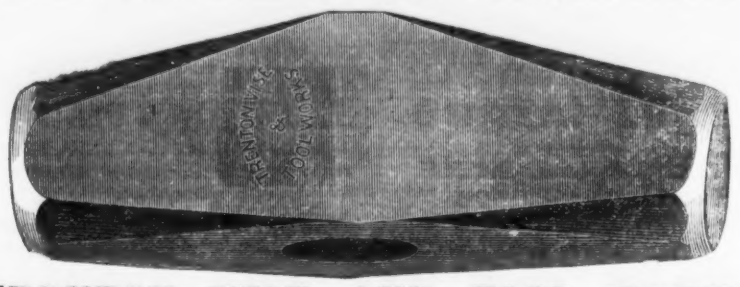

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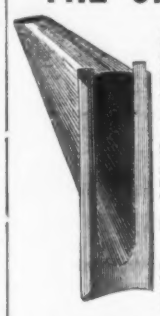
Our Vises are warranted to do more work than any other make. No broken boxes or screws.

"THE CHICAGO" TEA KETTLE.



We herewith illustrate the only really good TIN TEA KETTLE now made. We furnish only the Trimmings for them; and show cuts of the Handle and Spout. The former article is much stronger than any handle which has ever been introduced. It *fits the hand* splendidly, and being *hollow*, NEVER HEATS. The ear is strong and has a wide base. Altogether it is a fine thing, and sells at sight.

Price Plain, 75 cts. per doz.: Re-tinned, 90 cts.

The Spout, it will be noticed, is stamped from one piece of I x Tin, and side flanges folded ready to lock into the body of the kettle; it is then double seamed to the bottom, as the rest of the body is. It never leaks, as do all other spouts, and cannot clog with lime. We have sold immense quantities of them, and the sale grows constantly.

Re-tinned, per doz.—5 in., (No. 50,) 67 cts.; 6 in., (No. 60.) 75 cts., 6½ in., (No. 70.) 80 cts.

All are 2⅜ in. wide.

☞ If you make all of your Tea Kettles with the CHICAGO TRIMMINGS, you will materially increase your trade.

F. STURGES & CO.,

Proprietors of the

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AWARDED NOV. 21, 1874

This Compound is manufactured under the inventor's personal supervision, and is put up and warranted genuine only in 1, 5, 10, 50 and 100 lb. packages, and under the above trade mark. The 1, 5 and 10 lb. packages are kept for sale by the following, among other houses, who will also procure, on order, the larger ones:

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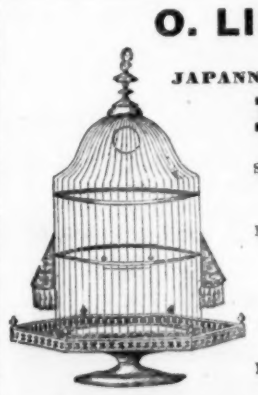

Dates of our Patents:

September 3d, 1861.
October 4th, 1870.
August 29th, 1871.
November 7th, 1871.
January 2d, 1872.
March 12th, 1872.
February 4th, 1873.
November 17th, 1874.
December 8th, 1874.
Re-issue, October 29th 1874.
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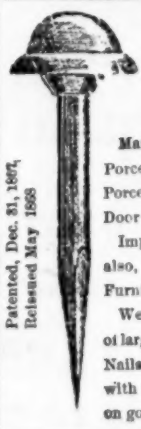

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PRICE LIST. Per Pair.

No. 1.—With Blued Footplate, and Runners the same as the best..... $5 00
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A Chapter from an Early Railway History.

A paper read by Mr. J. Munsell, before the Albany Institute, gives some interesting facts connected with the early history of the Mohawk and Hudson Railroad: "It appears that in 1812 a pamphlet was published for the purpose of explaining the superior advantages of railways and steam carriages over canal navigation, particularly on the peculiarly favorable route from Lake Erie to the Hudson, which had been the ancient trail of the Indians. Mr. Stevens, of New Jersey, endeavored to persuade all who were engaged in public improvements, that railroads were cheaper and more effective, as well as far more rapid in transit than was possible to be attained by water. Mr. Featherstonhaugh, of Schenectady, also put in a plea for railroads. The great canal enterprises in which the state was at that time engaged, overshadowed for the time the railroad scheme, but no sooner was the Erie Canal completed than a system of railroads parallel to its course was proposed. A writer in the Albany *Argus*, of 1825, urged upon capitalists the absolute necessity of entering upon the construction of a railroad to Schenectady, to prevent the city from going to decay through the rivalry of Troy. We find, accordingly, that in November of that year it was announced agreeably to the statute that an application would be made to the next legislature for an act to incorporate a company to construct a railroad from Schenectady to the Hudson at Albany, or Troy, as deemed advisable.

The project was brought before the legislature early in the session of 1826 in the form of a Bill to incorporate the Mohawk and Hudson Railroad. It was discussed in the Assembly on the 10th of March, and Mr. Munsell gives some amusing instances of the arguments advanced by some of the legislators. The Bill passed the Assembly on the 27th of March, 1826, incorporating the company with a capital of $300,000, with liberty to increase it to $500,000. This was the first charter of what became a successful passenger railroad on the American continent. The South Carolina road was incorporated nearly two years later, and its construction began in 1828. The Delaware and Hudson, and the Baltimore and Ohio roads were also begun in 1828. The first two practical locomotives built in America, were constructed at the West Point Foundry, New York city, for the South Carolina line, and the trial trip was made in 1830. The third was the "De Witt Clinton," built at the same establishment for the Mohawk and Hudson line, and put in operation about a year later.

Although the issue of stock was commenced in June, 1826, ground was not broken until July, 1830. The road was supported upon square beds of rubble, in which a heavy stone block was imbedded, each pier containing 11 cubic feet of block and rubble stone. The piers were distant 3 feet from center to center, and formed a nearly continuous stone wall. It was claimed that the construction of the road was superior to any other in the world! On the 27th of July the "De Witt Clinton" locomotive was put upon the road, and on the 30th an experimental trip was made, but the speed did not exceed 7 miles per hour. Although a better result was attained when coke was substituted for coal, the engine was eventually returned for alterations. It was again tried on the 8th of September, but there was a difficulty with the feed pipe, and the engine was unable to perform the return trip. On the 17th of September, 1831, a locomotive which had been ordered from Stephenson (similar to those on the Liverpool and Manchester line) was placed on the road. It was not, however, until the 22d of September that the directors advertised a regular service of passenger trains, and the precise date at which the complete success of the effort was crowned by a grand excursion appears to be the 24th of September, 1831. A large number of officials were invited, and it was intended that the English engine, named the "Robert Fulton," should move an imposing train. But there was a difficulty with the feed pipe, and eventually the American locomotive, the "De Witt Clinton," started with a train of three carriages, the others following by horse-power. The frontispiece of Mr. Munsell's pamphlet gives a representation of a portion of the train from a silhouette cut out at the time. The carriages were stage-coach bodies placed upon trucks and supported by thorough braces. The tender was a platform upon a truck, on which fuel was placed with provision of a tank at the half-way house for water to carry the train through. Such then was the definite opening of the first chartered railway in the United States. It was not the earliest railway in that country, the South Carolina and the Baltimore lines, though originated subsequently, were opened prior to the Mohawk and Hudson Railway. It was, however, undoubtedly the first in the State of New York. The daily average of passengers during August (when the line was only worked fitfully and partly by horse-power) was 180; in the following month it had risen to 322. Mr. Munsell gives a list of "the names of such invited guests as have survived the lapse of time and memory." Three of their number were still living in May of this year. He also furnishes some amusing particulars of the subsequent difficulties of the directors with the turnpike authorities, who compelled them to construct an unproductive branch—a proceeding which we need hardly remind our readers has not been altogether unknown in the later history of the railway system.

Keystone Iron Works.—A correspondent of the Chicago *Journal of Commerce* has the following in relation to the Keystone Iron Works, at Kansas City: In a country that is comparatively new, where all classes of mill and other machinery are required, it is good to have such establishments as this. It has the most extensive and varied facilities of any similar works I have visited in the West. When I first entered the foundry yards I was attracted by several large and ponderous castings that had just been taken from the mold and were to be used in the new Kansas Pacific round house, at Armstrong. I found soon, though, upon surveying the place, that they are in the habit of turning out great heavy castings all the time. There are two foundries—one for iron and one for brass. I was shown several steam engines in course of construction for different localities. Messrs. D. M. Jarbce & Co., the proprietors, are aggressive men and good machinists. The superintendent, Mr. James Smith, is one of the most practical mechanics of the West. There is nothing in the machinery line that this establishment is not prepared to furnish.

The New Gas Pipe Line from Butler County to Sharpsburg.

Great interest is manifested at the present time in Pittsburgh and other portions of Western Pennsylvania in the apparent success of efforts which have been in progress for some time to conduct the natural gas found in counties contiguous to the oil region, over considerable distances, in sufficient quantities to render it available in large furnaces and other works devoted to the manufacture of iron. The practicability of employing the natural gas for such purposes, at points near the deposits, has been thoroughly demonstrated, and notably by Rogers & Burchfield, of whose operations the following account is given by the Pittsburgh *Dispatch*: "In 1871 Mr. Gillen commenced boring a well at Leechburg, Armstrong county, for oil or salt. At a depth of 1350 feet he struck a heavy flow of gas, and in such quantities that further work upon the well was impossible. This well is still pouring out gas without any diminution in force, and has a discharge of enough to fully supply any three mills in Pittsburgh. In 1873, in hope of getting back some of the money spent in boring, Mr. Gillen made a proposition to Rogers & Burchfield, who had a rolling mill near there, to furnish them all the fuel they needed. The firm did not consider it practical and refused the offer. The next year Mr. Gillen made application to the Patent Office for a patent on a process and apparatus for preparing natural gas as a fuel for the manufacture of iron and steel. Mr. Rogers also afterward applied for a patent, but after some time Mr. Gillen obtained one, dated October 6th, 1874, and subsequently another dated August 31st, 1875. The gas was introduced in Rogers & Burchfield's mill, and according to a statement from that firm, saved them $60,000 per annum, although they were employing only 125 men." The next step was to conduct gas over a distance of about five miles, which also proved successful, but the most recent and important event has been the construction of pipes through which gas was conducted from Butler county, Pennsylvania, over a distance of eighteen miles, to the mills of Graff, Bennett & Co., and Spang, Chalfant & Co., on the West Penn Railroad, in Sharpsburg and Ætna. Of this event the Pittsburgh *Chronicle*, of October 23d, says:

"Day before yesterday the work of pipe laying was completed, and yesterday afternoon the grand test of the practicability of the scheme was made. The furnaces of neither of the establishments were ready for the change, for whether the gas would flow with sufficient force was naturally to be demonstrated first, but, at the ends of the main pipes at both places smaller pipes were attached ready to be touched with flame when it was shown that the gas really came through in a corresponding quantity. At four o'clock it had been arranged that the connection should be made at the well, and, the air having been exhausted from the 18 miles line, this was done. In 20 minutes gas was rushing through the termini of the pipe, and being lighted, flared up 40 feet with a volume sufficient to supply double the quantity of heat required at each mill. A large number of prominent gentlemen of the city were present, and when the entire utility of the plan was fully demonstrated, there was much rejoicing. Last night the boroughs, both Ætna and Sharpsburg, were brilliantly illuminated by the volume of flame leading from the pipes. In about a week the furnaces will be adapted to the use of this new fuel, and a saving of $40,000 to $50,000 in each effected per annum."

The next step projected is the extension of the gas pipe lines to Pittsburgh, only four or five miles distant from Sharpsburg, and among the things predicted or hoped for, as a consequence of the success of this enterprise, is the supply of an abundant and cheap fuel that will enable the iron manufacturers of Pittsburgh to dispense with supplies of coal, and to materially diminish the cost of manufacturing iron.

Kansas Rolling Mill Company.—The Chicago *Journal of Commerce* says: This company, having leased, put in perfect running order, and started, the Topeka Rolling Mill, at North Topeka, Kansas, have also nearly completed a large mill at Rosedale, Kansas, on the line of the Missouri River, Fort Scott & Gulf Railway, and will be prepared in a few weeks to furnish 150 tons of rails per day. The buildings at Rosedale are constructed after the most approved designs, and the machinery being of the latest patterns, with all profitable improvements, admits of the manufacture of iron of a superior quality. In fact this company has a reputation in this State, and others of the West, for making the best iron ever put in a railroad. Mr. A. B. Stone, of New York, president of the Cleveland Rolling Mill Co., the Union Rolling Mill Co., of Chicago, the American Bridge Co., and other corporations, is also president of the Kansas Rolling Mill Co. Col. W. H. Harris, of Kansas City, is vice-president and general manager, and Ira Harris, Jr., of Kansas City, is secretary. The general office of the company is located in Kansas City, Mo.

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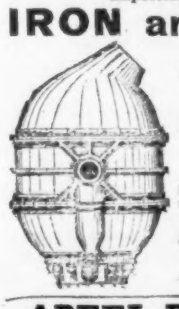
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Special Irons for Bridge and Architectural Work.

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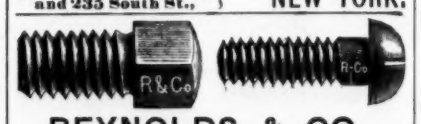

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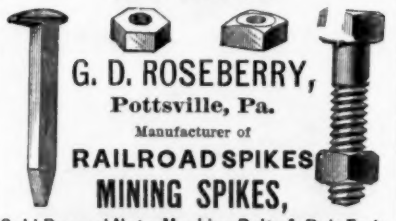
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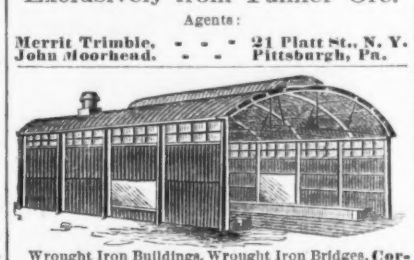

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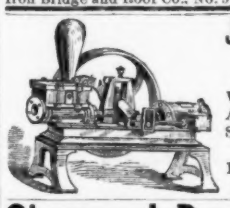

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The Company's works for manufacturing BESSEMER STEEL RAIL will be completed during the summer of 1875.

New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN ANNEALING FURNACES.

Specification forming part of Letters Patent No. 168,513, dated October 5, 1875, issued to William S. McKenna, of Pittsburgh, Pa.

Figure 1 is a vertical transverse section through the middle. Fig. 2 is a view showing longitudinal vertical sections, one through the central oven and one inside exterior walls. Fig. 3 is a plan of walls for fire pit and smoke and heat passages.

This invention relates to improvements in furnaces for annealing iron, glass, porcelain, &c., and its purposes are chiefly intended to be accomplished in cases where the articles are to be annealed in bulk; but its chief object is to provide an annealing furnace for cut nails, so arranged that the nails may be annealed in bulk with unusual facility, without the usual impediments of annealing boxes, spoiled nails, or only half annealed, and at the same time double or treble the quantity with the same amount of heat. The invention, accordingly, consists in the novel construction of an annealing furnace, having the characteristics of form and arrangement as hereinafter described and claimed.

The greatest economy lies in the use of three cylinders or ovens.

The fire is in the center of one end, but if necessary may be the entire length of the furnace. On either side of this are built walls to a certain arbitrary hight. Then, outside these containing walls of the fire place, are constructed several walls, rising nearly, but not quite, to the hight of the former, and so disposed in relation to their ends that they form a sinuous passage backward and forward —*i. e.*, one wall extending from the front nearly to the back of the furnace, the next nearly from the back to the front, so that when covered by tiles they form a continuous serpentine passage way for the heat and smoke backward and forward, or from side to side, under the tiles, and finally ending in a passage leading to the smoke stack. One large or several small tiles are then laid on these walls, so as to leave the outside passage way uncovered. The object will be seen. When the tiles are laid on, a cast iron or fire clay oven of uniform bore is then laid, one on each side of the fire place, and immediately over the tiled passages, also leaving free entrance to the extreme side passage on each side. Then, between the side ovens, and on top of them, brick or other arches are built up at intervals laterally, also arched on their top and arched underneath where they rest on the hearth. These retain the side ovens in place, and furnish underneath a pass to the flames the length of the oven, and laterally a series of flues between the two side ovens and the upper one, which is then placed on a bed formed in each of the cross-arches, and at a slight distance from the side ovens, so as to afford passage ways or flues for the flames and smoke between the ovens and cross-arches. A solid top is then built upon the cross-arches, leaving no connection between sides at the top of middle oven, while the flues leading to the smoke stack are built in this top, to make a compact body of all. The cylinders are provided with luting doors, which have small slides in them to observe the stages of annealing. The flues and passageways are all provided with suitable openings for cleaning and draft regulating purposes.

The operation is as follows: The caloric rises from the coals, part passing along the archway on the hearth, and then, with the rest, rising up through the flues between the top and side ovens, between the arches, over the side ovens, then dives down into the respective outside or extreme flue of the sinuous passages under the side ovens, where it threads along back and forth, or from side to side, until it reaches the interior passage, then down along this to the lateral flue, to the chimney flue, thence to the smoke stack. All this is outside the cylinders, and the two outside ovens are protected underneath by tiles, while the top one is made thicker at the bottom for like protection. When the cylinders or ovens are properly heated, the nails are shoveled in simply in bulk, the doors are closed and luted air tight, and all remain until a cherry red heat is reached, which is known by looking in at the slide openings, which may be protected by mica or other material. When the proper degree of heat is reached, the doors are opened, nails raked out into bins, and allowed to cool as they stand, when they are kegged and ready for market.

In ordinary construction the heat is necessarily greater in some parts than in others, and for that reason the process of cooling must be gradual, whereas, by this plan, all being heated exactly to the same degree, and the nails being in large masses, they may be at once removed and allowed to cool outside, which gives them a slight degree of hardness, combined with the flexibility and toughness required in a good nail.

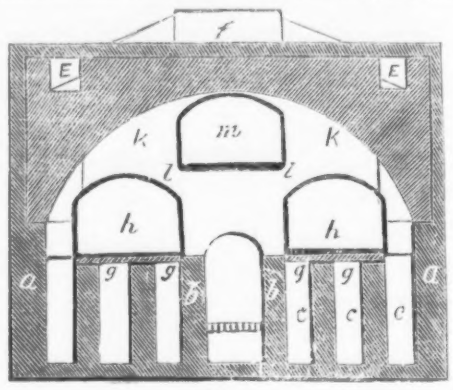

Fig. 1.

IMPROVED ANNEALING FURNACE.

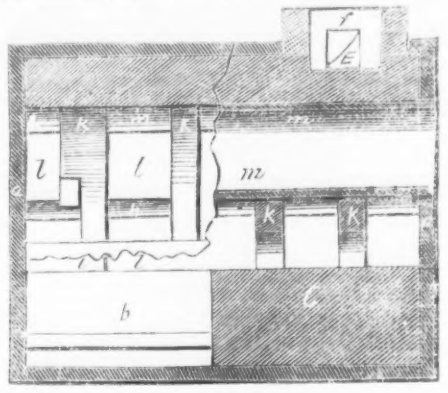

Fig. 2.

Referring to the accompanying drawings, *a a* are the surrounding walls of the furnace; *b b* the walls of the fire pit, with its hearth *c* between them. On either side of these walls *b b* are built the walls forming the serpentine flues *c c*, which end in the lateral flues *d d*, leading to the chimney flues *e e*, passing into smoke stack *f*. On top of the walls forming flues *c c* are laid tiles *g g*, covering all but the extreme outside passage on either side of the furnace. Then the two side ovens *h h* are placed in position over the tiles *g g*, also leaving the outer passage open and free. Then the cross-arches *k k* are built at intervals apart to allow room for the passages between the side and top cylinders or ovens. These arches *k k* form between them the flues *l l*. The top oven *m* is then placed, and a solid arched top built over all. This causes the formation or continuation of the flues *l l* down over the side ovens and into the side passages *c c*, and so on, as described.

Claim.—1. In a furnace for annealing solids, the combination, with the retorts *h m h*, one or more, and the arches or walls *k*, forming flues *l*, of the sinuous horizontal flues *c c*, &c.

2. The combination, with the annealing ovens

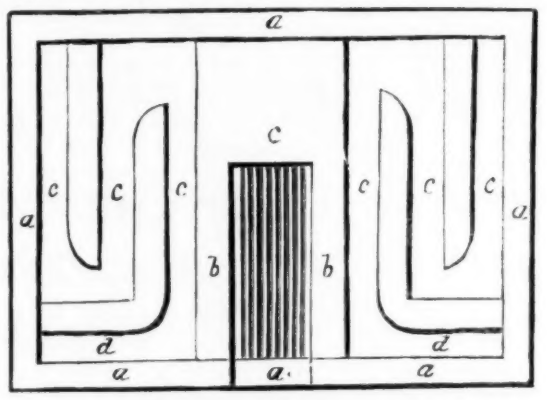

Fig. 3.

h m h, one or more, of the diving flues *l* and sinuous flues *c c*.

3. The tiles *g*, in combination with the horizontal annealing ovens *h h* and sinuous flues *c c*.

4. In an annealing furnace for solids, the horizontal annealing oven of uniform bore, and made in one piece.

5. The combination, with an annealing oven, of a door or cap at one end, having a covered aperture.

6. The improved annealing furnace, consisting of and comprising the internally arched body *a*, the ovens *h h m*, one or more, of uniform bore, the ovens *h h* being arranged at the sides of, and the oven *m* above, the fire place, and against the furnace arch, the arches *k* supporting said oven *m*, and resting on ovens *h*, forming the lateral flues *l*, and the sinuous flues *c c* passing underneath the ovens *h h*, all as shown, and for the purpose specified.

IMPROVEMENT IN THE MANUFACTURE OF IRON.

Specification forming part of Letters Patent No. 168,263, dated September 28, 1875, issued to Albert C. Lewis, of Brooklyn, N. Y.:

The object of this invention is to remove the impurities of cast iron and adapt the same to the manufacture of wrought or cast iron or steel.

Nearly all pig iron contains considerable silicon, with sometimes manganese, and more or less of phosphorus and sulphur in addition to the carbon.

The object of this invention is to remove the silicon and the principal portion of the sulphur and phosphorus, so as to obtain iron that is as nearly pure as possible. Of course, the carbon will be either removed or allowed to remain, according to the quality desired in the product, so as to form a higher or lower grade of steel.

For iron which contains about ·0220 of sulphur, ·0203 of phosphorus, ·1652 of silicon and ·089 of manganese, employ the following materials: Silica, by weight, about 14 parts; manganese, by weight, about 28 parts; wolfram, by weight, about 58 parts. These are to be mixed together in a ground condition.

The silica which is made use of is found in Nevada, and is nearly pure, and it is known in the market as silica or electro-silicon.

For the manufacture of wrought iron is taken of said mixture from 1½ to 3½ per cent., and throw the same into the furnace during the heating and puddling operation. It is preferable to divide up such material into about four charges, and introduce the same at intervals of about 10 minutes apart during the puddling operation.

Wrought iron prepared in this manner possesses great purity, and more or less carbon may be allowed to remain, so that the same is a low quality of steel, and, by analysis, iron of this character is found to be free from silicon and manganese, and with such small traces of sulphur and phosphorus as to be scarcely capable of detection.

In the process the silica and manganese, added with the wolfram to the iron, appear to combine with the foreign matters in the iron, and pass away in the slag or the gases evolved; and other ingredients having the same properties as the manganese and wolfram may be substituted for those substances, and the proportions may vary according to the impurities in the iron.

With cast iron and steel and Bessemer steel the ingredients named may be employed for removing the silicon, manganese, phosphorus and other matters, and the product will be improved thereby, and according to the manner of conducting the refining operation, so the product will contain more or less carbon, and be either a wrought or cast iron or steel of a higher or lower quality.

This improved method of purifying iron may be used in a puddling furnace, an open hearth furnace, or in a ladle after melting in a cupola, or in a crucible, in the manufacture of cast steel from the Bessemer scrap or iron of inferior quality.

Claim.—The method herein specified of removing foreign substances from iron by a mixture composed of the above described silica, wolfram and manganese introduced into the melted metal, substantially as and for the purposes set forth.

Southern Iron Works.

The *North American*, in an editorial upon the enterprise displayed in the iron business at the South, says that the great interest that has been taken in the development of its iron resources by the South since the war is one of the most remarkable facts of the period, and is paralled only by the success that has been attained and the expectations that are held. The progress would have been remarkable under any conditions; but the beginning was made at a period of great prostration, when the food crops and those of cotton and turpentine, and grazing and the lumber trade and railway construction were all demanding means and labor; when the manufacture of cotton was not only agitated, but zealously pushed forward, and while very little was known respecting the iron mines, and coal was not easily procurable and skilled labor was wanting.

And now the Charleston *Courier* names fifty-five furnaces in only five States—the Carolinas, Alabama, Georgia and Tennessee, of which four are in process of construction. Fourteen belong to Alabama and twenty-four to Tennessee, and it is an instructive fact that thirty use charcoal and four coke, and that it is the hot blast charcoal iron that has given to Alabama its great success and secured from seven to eight pounds sterling per ton when shipped to England. Charcoal can be procured there at less than seven cents and coke at ten and under, thus enabling the manufacture of this variety of iron to be profitably extended. The *Courier's* account does not consider what has been done in Virginia and West Virginia, in Texas and Arkansas—in each of which States there has been considerable gain; and it is imperfect in other details. It is nevertheless an additional evidence that the South is being strongly attached to the North by new industries, aims and opportunities; an evidence that industry is active and capital being created, and that this transpires under conditions that must commend them in their consequences, and for general as well as local application. The Southern revival has been great and rapid. It is only begun, and interest has chiefly to see that the variety of the opportunities and their amount do not betray ambition to undertake more than can be mastered and perfected. This particular growth, however, establishes the fact that England is threatened by other rivalry than that of Bosnia and Veronetz and India—that all of the Union will some time be united against all of the world in more than one great effort.

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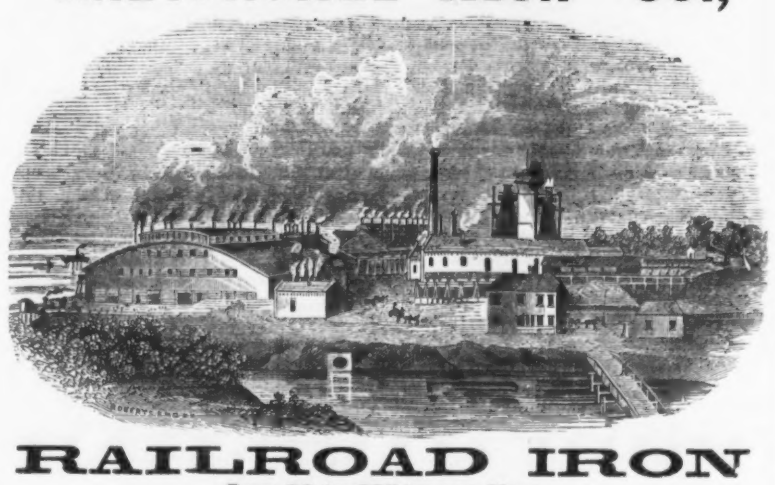

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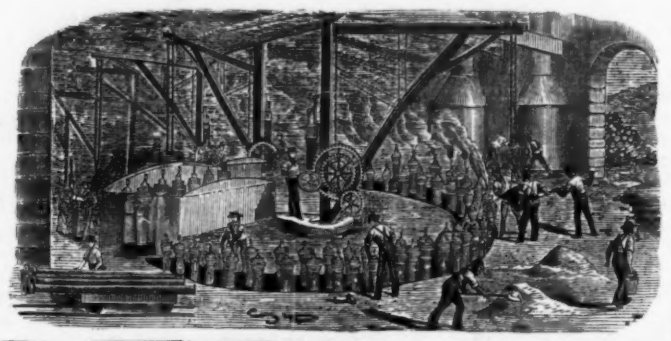

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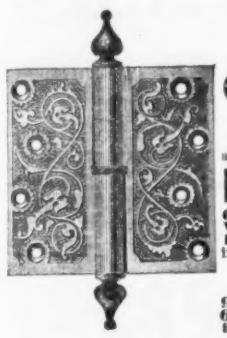

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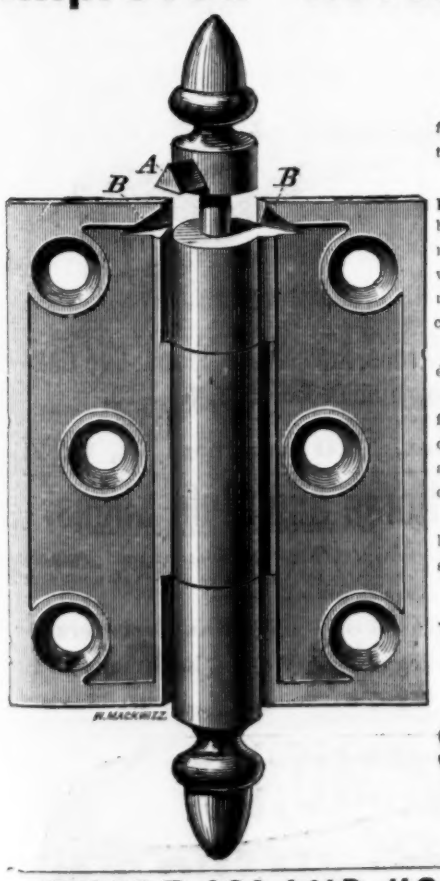

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Blast Furnace Hearths.*

BY MR. CHARLES WOOD, Tees Iron Works, Middlesbrough.

The importance of the best construction for a blast furnace hearth has for many years occupied much of my thought and attention, stimulated each time a furnace has had to be rebuilt, or the defects deplored; every time a hearth has given way, from the metal sinking through the bottom, or from the failure of the crucible or well walls, from the setting of the metal in the fore-hearth, or from the slag refusing to come forward, and the consequent evils.

Considering the large number of furnaces in the United Kingdom, the scientific attainments of many of the masters, the varied experience of the managers, the different kinds of materials smelted, coupled with the great range in size and in the materials employed in their construction, I am quite aware that in expressing these ideas I may meet with many opposite views, but, however this may be, I hope that the members of the Iron and Steel Institute will make a fair allowance, and not be too severe in their criticisms, but will remember that in correcting any errors they will be adding interest to my paper, and that every experience recorded in discussion is to chronicle a lesson for our future guidance.

The judicious guarding against errors on the one hand, and the careful combination of such experience on the other, may lead to what I consider is greatly required—further improvements.

When the furnace linings are burnt out they are best blown out. My experience is, that it is utterly impossible to regulate the quality of the iron, and that the blast cannot either be directed or concentrated, which is so necessary to proper fusion. One day it will be found that the furnace is working hot on one side, or that the slag will quickly turn black or is difficult to run. Or the furnace will scaffold and large lumps will come down, and these lumps, being difficult to fuse, will lie for hours in front of the tuyeres, turning the current of blast in another direction. Whilst the iron lying over such a large surface of hearth is at times difficult to get to run, or, to use the furnacemen's term, "the metal lies back."

Now, these are conditions rarely found, or combined in a new furnace, where the hearth and well walls will be in proper shape, but common enough when they are burnt out. Again: Is it to be wondered that the hearths lift or burn away? How is it possible that the heat can escape? And how few large furnaces with thick walls are there that have not more or less lost their hearths and formed their own artificial metallic bottoms? I have known furnaces after they have been blowing only a few months to lose as much as from 400 tons to 600 tons of iron before they yield their proper make, and I have observed more particularly that the larger the furnace the greater will this loss be. Nor must we overlook the fact that the life of these large furnaces to be kept in blast is much shorter than the small furnaces, and as the sizes have increased so has the life of the hearth and bottom decreased.

As I have mentioned in another part of my paper, it is no uncommon thing to hear of furnaces in Staffordshire and Wales being in blast from 18 to 21 years, whilst in the Cleveland district seven or eight years have been found quite sufficient for them to work economically.

In the old furnaces, where the nozzles of the tuyeres were within 4 ft. 6 in. to 5 ft. distant from each other, the blast was always sufficiently concentrated in the center of the furnace to insure regular working. But, as furnaces were increased in size, larger hearths or wells were thought necessary to hold the extra quantity of metal made. Consequently the tuyeres were forced further apart, and, within certain limits, with evident improvement, until the furnace became burnt away, when the blast, having play in so vast a chamber, is no longer centralized, and the fusion, as before pointed out, is irregularly carried on.

Take again the old fore-hearth as adapted to our large furnaces. The opening is commonly 5 ft. long by 2 ft. 6 in. wide, with the tapping hole often 6 ft. from the well, and those only who have to work furnaces on this system know the immense trouble, labor and loss of time necessary, when furnaces are out of order, before they can be tapped, or the slag be got to rise. And this not unfrequently happens when in other respects the furnace is working well. It is frequently the case that with a hard tap hole the furnacemen have to labor five or six hours before the metal can be got into the pig beds, whilst to make the slag run after the blast has been off or from other causes, entails upon the keeper equally severe labor and anxious attention. The expense for working bars, hammers and fire clay, at such times, is very heavy. And this all arises from the fact that both the iron and the slag, before they can escape from the furnace, have to enter this cold chamber called a fore-hearth. Why does the furnace keeper rejoice when he sees the slag beginning to run? It is because he knows that in so doing it not only relieves the furnace but that it brings heat along with it, warming up the fore-hearth and preparing the way for the iron.

With all these facts before us, it seems quite evident that we should direct our attention to the preservation of the original form in which the hearth and well was built, and to do, if possible, without the fore-hearth. We will now see what has been accomplished in this direction. The old charcoal blast furnaces had their hearths of very small dimensions. Two feet diameter, or, as they were more often made, about the same dimensions square, was considered a good size, and so small was the make of iron (and this being made only from the richest ores) that the cinder or slag was of so little importance that it was simply run off after the iron at the tapping hole. This mode is common on the Continent even at the present day where charcoal is used as fuel. As the size and the make of the furnaces increased, the slag was drawn off periodically through a hole or slit made above the tap hole in front of the furnace, this in small furnaces being the only accessible place where men had room to work. With further improvements and heavier pressure of blast it was soon found necessary to let the slag run continuously. This constant running quickly cut away the brick work between the tapping hole and the slag hole, uniting the two holes together, thus forming the first fore-hearth. It being found at this time impossible to prevent the two holes uniting, the best was made of a bad job, fore-hearths became the established fact, and this, with slight modifications, has been the universal shape in which blast furnace hearths have been built up to the present time.

In 1794, John Wilkinson, of Berwick-on-Tweed, took out a patent for improvements in blast furnaces, wherein is shown two plans, one having a circular hearth and the other with an oval hearth, both having three tuyeres, but in these the quantity of slag made was so small that no provision was made for its escape other than the tapping hole.

The next patent of any interest connected with this special subject was taken out in 1802 by one James Birch, of Abernant, Glamorganshire. This furnace has two fore-parts—a square well, or crucible, and two tymps, on opposite sides of the furnace. (I may here remark that this is the first instance where tymp plates are spoken of). It is quite certain that the slag could be drawn off on one side or the other, and equally certain that it would be drawn off on the side opposite to that where the pig was being prepared. Consequently, we may presume that this was the first instance where the slag was drawn off otherwise than over the iron tapping hole.

The next modification of importance was that patented by Mr. Alger, an American, in 1857. The hearth, like that of Wilkinson's, is oval in shape, but in another point it resembles Birch's, inasmuch as it appears that the tapping and slagging could be carried on at different ends or sides of the furnace.

About 1852 a good deal of attention and ingenuity seem to have been directed by two or three inventors to make the hearths of blast furnaces removable.

These portable hearths and wells contained the tuyeres, dam plate, &c., all complete, were built upon a strong carriage on rails, and were from 4 ft. to 6 ft. in hight above the tuyeres, the bottom of the hearth being left hollow, as under a puddling furnace, to keep it cool whilst the joint was made between the movable and fixed part of the furnace by ramming in fire-clay. A spare hearth is supposed to have been kept, which could be run under the furnace at a short notice, thus renewing, in an hour or two, the most important part of the furnace. I may also mention that within the present year a similar scheme, with slight modifications, has been again patented.

In April, 1863, Astley P. Price, and in June of the same year George Bedson, took out patents for furnaces with water casings completely enveloping the wells and boshes. There is no doubt that these would most effectually preserve the shape of the boshes and hearths, for in Thomas's cupola, patented in 1868, he works continually with only 3 in. of lining of fire clay on the inside of water cooled boshes, and although I do not recommend this system to blast furnaces, this plan supplies the most perfect protection to the lining yet invented.

In August, 1869, Joseph Bonne, of Cluis (Indre), France, patented a novelty in the way of furnace hearths, which is worthy of a few remarks, because he makes his crucible or well of very thin brick work or fire clay, protected by thick cast iron plates, which run up nearly to the boshes. The brick work lining is not shown more than 6 in. or 8 in. thick, the plates being kept cool by the outside air, but the chief point of interest in this arrangement is the complete way in which he has closed up his hearth, having neither tymp plate, dam plate nor fore hearth, the slag being let off at intervals through a small hole, which is stopped by a shutter.

I should think this arrangement far more likely to suit the small Continental charcoal furnaces than the present type of English coke furnaces.

In 1862, Mr. Barrett, of Norton, near Stockton-on-Tees, filled his ordinary fore-hearth completely up with fire clay, and worked his furnaces with the front quite closed up, a hole being made through the fire clay for the slag; and, as the hole burnt away, fresh fire clay was rammed in. This plan worked so well that when he (Mr. Barrett) erected his large furnaces in 1866, he built them upon the same system, but making his well with two tapping holes and two slagging holes on opposite sides of the hearth, arranged in the same way as in Birch's and in Alger's furnaces, except that the hearth was circular.

These furnaces continue to work well, and were for some time the only ones in the Cleveland district, perhaps in England, which worked with a closed front.

A few years later, Mr. Alfred Hill, in building some new furnaces for Mr. Thomas Vaughan, at Clay-lane, improved upon Mr. Bartlett's plan by filling up the fore-hearth with brickwork, instead of fire clay, and recessing the tapping hole so as to be close to the inside of the well. The slag is drawn off over the recessed tapping hole through fire clay, close under the tymp in the usual way. There is, consequently, no fore-hearth, and the furnaces are completely closed. These furnaces have worked on this system up to the present time, and Mr. Dobbs, Mr. Hill's successor, has again improved Mr. Hill's design by having the slagging hole on one side of the tuyere and the tapping hole on the other, there being no fore-hearth or dam plate.

The chief defect of all these plans is that the slag hole cannot easily be kept under control, the slag cutting or eating away the brickwork and fire clay so quickly that the furnaces are liable to blow through too much, whilst the amount of fire clay consumed, although much diminished when compared with the old fore-hearth system, is still considerable.

(To be continued.)

*Paper read before the Iron and Steel Institute at Manchester.

The Work on Diamond Reef, New York Harbor.

The *World*, of a recent date, gives the following in relation to the work in progress in the harbor:

The work of removing Way's Reef and the reef off 125th street, Harlem River, having been completed under the direction of General John Newton, the drilling scow is now engaged in removing Diamond Reef, which obstructs navigation of the channel between Governor's Island and the Battery. Drilling and blasting are continued day and night, and it is expected that the work of removing the reef will be completed early next spring. The scow is under the charge of Julius H. Stinedinger as civil engineer. It was taken to Diamond Reef, October 9. This reef is 400 feet long and 250 feet wide. It consists of gneiss rock, horizontally stratified and running in an easterly direction. The least depth of water at present on it is 19 feet, and it is intended to remove it to a minimum depth of 26 feet at mean low water, being 3½ feet more than the draught of the bar at Sandy Hook. The work will take about nine months of steady drilling and blasting, and will cost about $100,000. The debris is taken up by grappling machines and deposited on scows, which carry it away and dump it at the expense of private applicants who desire the material for filling in sunken lots. The crew, consisting of the working force, are the same men who have previously been engaged in the removal of Way's Reef, Quincy Reef, and the reef off 125th street, in Harlem River. They are picked men, each being able to attend a diver and to run the drilling engine, beside being first-class seaman. They are in charge of Capt. Karrow. There are three divers employed, who have to descend at slack water to make submarine surveys, marking the depth, plugging the drill holes and charging the plug holes with nitro-glycerine. The divers are all experienced wreckers. The size of boiler employed limits the number of holes to be drilled at one time to 7. The total number of drill pipes is 21; the hourly advance of the drills is from 9 inches to 4 feet, depending entirely upon the hardness of the rock and the swiftness of the tidal currents. The holes are about 7 feet apart, and are drilled about 3 feet below grade, in order to secure the required depths by one drilling process. The drill holes are charged with tin cans containing nitro-glycerine, into each of which a fuse, or exploder, is inserted, and connected with the battery on deck. The average number of blasts per week is about 3, and the average amount of tons of rock removed by each blast is about 200. The largest number of holes simultaneously fired on Diamond Reef has been 21, containing over 1100 pounds of nitro-glycerine, which is the largest amount ever fired by the scow. The cartridges used were filled with two-thirds nitro-glycerine to one-third water, throwing the water and rock about 150 feet high. When the debris is removed by the dredge a thorough survey of the reef is made, and the remaining loose stones are chained by the divers and raised on deck by derricks. To facilitate these final operations, a sounding machine has been designed and is in use. This machine consists of a horizontal iron bar lowered to the required depths and dragged over the reef. Each time it strikes, the diver descends and ascertains the character of the obstruction. The instrumental observations necessary for locating the position of the drill holes on the reefs are taken and flatted by the superintendent himself, sextants being used on board the scow, or theodolites on shore, for this field work. The charts used are the results of the hydrographic work of General Newton's surveyors.

Cork a Substitute for Leather.—The Paris correspondent of the London *Times* writes to that journal: A stall has lately been added to the Maritime Exhibition by the Cork Leather Company, for the purpose of showing a fabric which is very like leather, but with qualities not possessed by any animal's hide. It is well known that cork is the most brittle of barks, and yet, at the same time, the lightest of materials. The cork leather, which now makes its appearance for the first time, is simply sheets of cork covered on both sides with thin linen, but so prepared that when bent double it neither breaks nor cracks. What the solution is which produces this effect I cannot pretend to guess. If used as leather, it is certainly one-fourth the weight of hide, and looks as well, at half the cost. If in the guise of macintosh, it is as supple, and yet not sticky like ordinary waterproof. Boots and shoes are exhibited of this material, but the most efficient use to which it can be put seems to be for military accoutrements and tent cloths. The French War Office has ordered a soldier's complete outfit to be made of the cork leather, and I understand that the Duke of Cambridge has directed similar samples to be sent to the Horse Guards. With regard to tents, the material is, without doubt, impervious to water, for this is practically shown at the Exhibition, while it is said on good authority to be superior to ordinary canvas in resisting heat. If it be used in the army the tedious burden of kit, belt and cartouche-box will be very materially decreased. The inventor is a M. De Berski.

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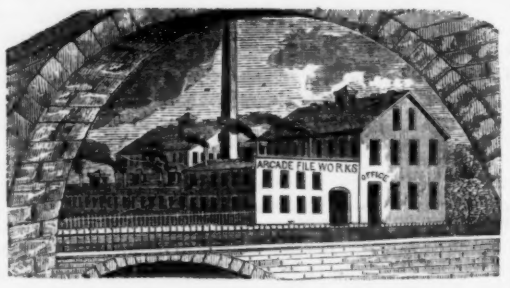

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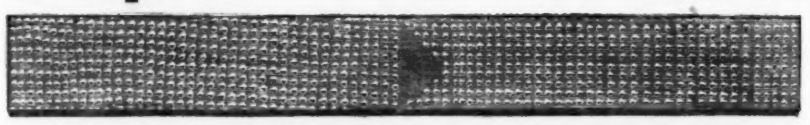

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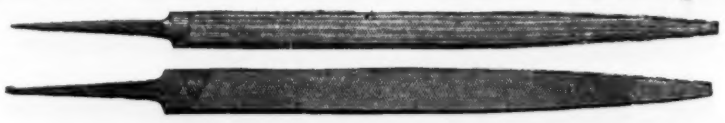

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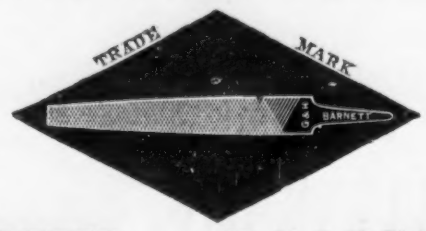

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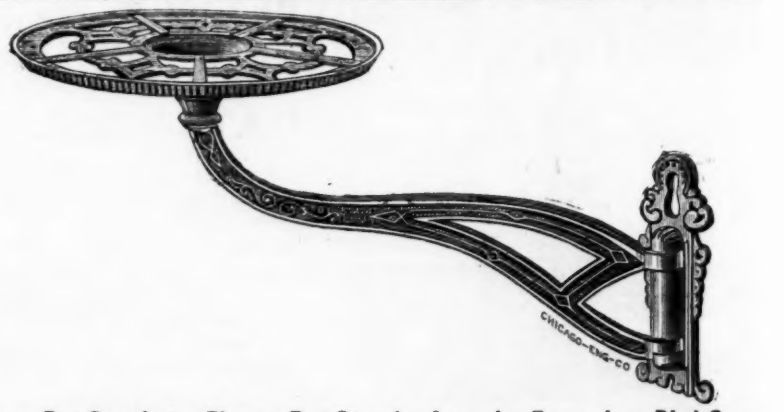

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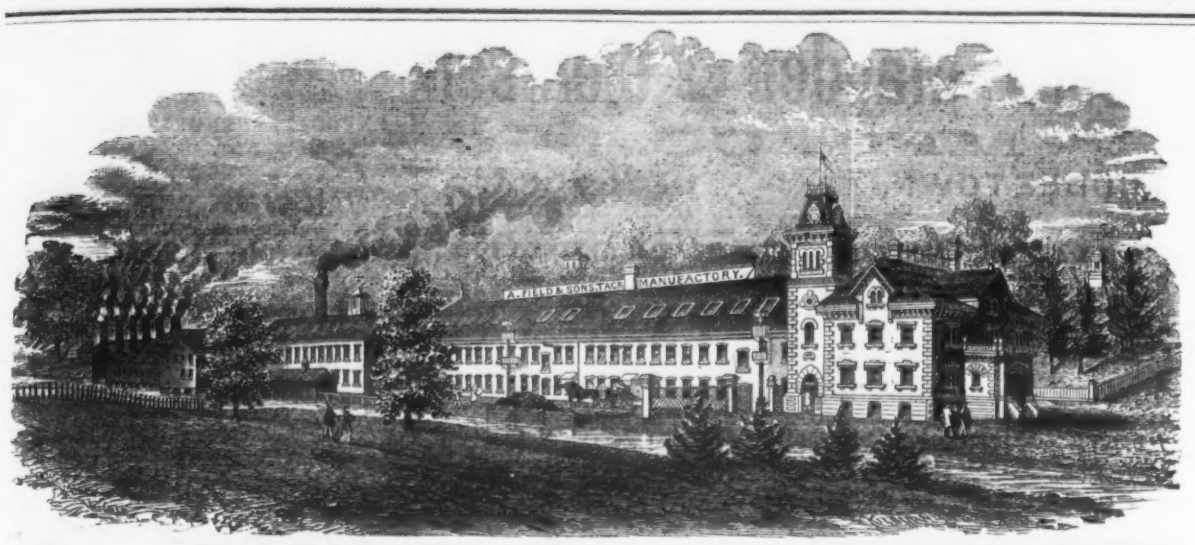

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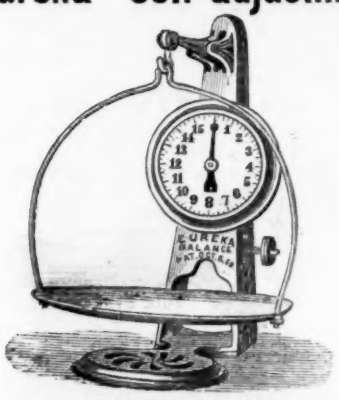

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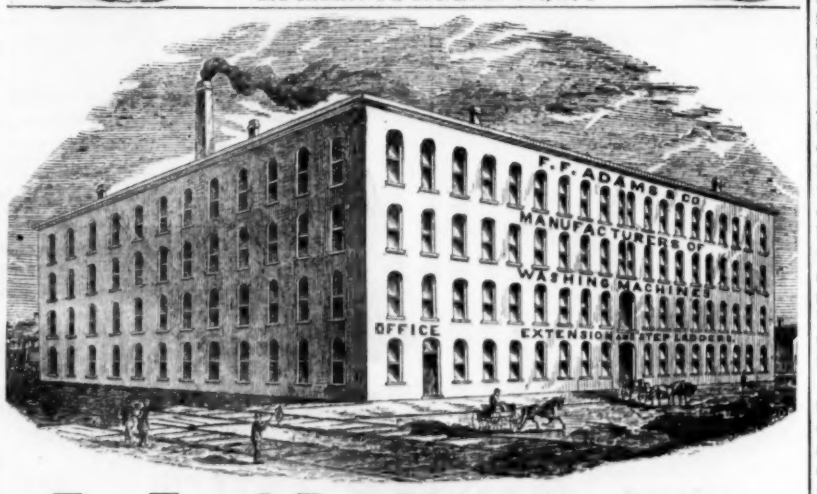

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Mediæval Metal in Birmingham.

Mediæval metal work and stained glass painting are among the most modern and the most artistic of Birmingham industries. The introduction of the first named is entirely due to Mr. John Hardman, and dates from the year 1838. Until that time it was not known in England. The elder Mr. Pugin was then just commencing his brilliant career, and fortunately met with Mr. Hardman, who entered warmly into the plans of the great architect, and, sharing his artistic spirit and his enthusiasm, brought his practical mind to bear on the subject, and the difficulties, though many and formidable, were at last conquered by the union of skill, persistency and energy with which they were met. At first Mr. Pugin had to obtain all his models abroad, as there were no properly qualified workmen in England who could reproduce his designs. Thanks, however, to the school founded by Mr. Hardman, this difficulty was at last overcome, and a class of workmen were taught who can now compete with the most skilled in Europe. Stained glass painting was added in 1845.

The mediæval metal now attained, not only a world wide reputation, but a state of artistic perfection as to rival the very best work of the much, and deservedly, praised Middle Ages. This has been attained by the union of the highest skill in design with the highest skill in manipulation. In fact, the excellence of execution depends upon this union, as all the work produced is the result of the active and intelligent combination of brains and hands. Machinery has no field for its remarkable automatic labors here; the work produced is the work of thinking, designing and intelligent workmen, combining all their faculties of art and craft for the end proposed.

One of the principal firms engaged in this industry in Birmingham is the firm of John Hardman & Co. A visitor to this establishment gives the following interesting particulars in regard to the manner of executing work, etc.:

One of the features in Messrs. Hardman's establishment—in fact, the principle adopted in relation to metal work—is that each metal shall be treated in accordance with its nature. Thus, in the case of iron, all the work produced is wrought; in brass, which is a compound metal, casting is introduced; and in gold or silver, articles, or parts of articles, are both wrought and cast. By the adoption of this principle the utmost beauty, both in design and execution, is attained of which each metal, in accordance with its nature, is capable. It is attention to this, combined with the application of the highest skill, which has made the work of this firm so justly celebrated.

In iron work, of course, there is little that can be described, as there are really no processes in its manufacture. All is handwork, whether it be a scroll, a leaf, a flower, or any other pattern. Each part is wrought by the hammer, each is beaten by the manipulative skill of the workman to the form and outline required. One of the earliest bits of work is twisting a bar of iron. The iron is made red hot, put in a vise, and the workman, with an iron wrench fixed at the end, twists it into the required shape. As soon as the first twist is made some cold water is thrown over the part twisted, and the operation is continued till the whole of the heated part is twisted. We saw an ornamental flower stand all made of wrought iron—a marvel of skillful manipulation. Every part of this splendid work is wrought—the scrolls, the leaves, the flowers. The parts representing twisted iron, the baskets, the points, are all made by hand. We have seen the masterpiece of Quintyn Matsys, which stands by Notre Dame in the Place Verte at Antwerp, the masterpieces of iron work in the favorite home of this work, Nuremberg; but a finer piece of such metal work has, we venture to say, not been made than this example of nineteenth century labor executed by Messrs. Hardman in the much abused town of Birmingham. Of this metal Mr. Ruskin has eloquently written: "Iron is eminently a ductile and tenacious substance, tenacious above all things, ductile more than most. When you want tenacity, therefore, and involved form, take wrought iron. It is eminently made for that. It is the material given to the sculptor as the companion of marble, with a message from the lips of the Earth-Mother: 'Here's for you to cut, and here's for you to hammer. Shape this; twist that. What is solid and simple, carve out; what is thin and entangled, beat out. I give you all kinds of forms to be delighted in—fluttering leaves as well as fair bodies; twisted branches as well as open brows. The leaf and the branch you may beat and drag into their imagery; the body and brow you shall reverently touch into their imagery. And if you choose rightly and work rightly, what you do shall be safe afterward. Your slender leaves shall not break off in my tenacious iron, though they may be rusted a little with an iron autumn.'"

Work in brass is first cast in the usual manner. A great deal of work is produced, however, by core-casting, and great care and skill are required in this delicate operation. When cast the round parts are turned, but all the parts which cannot be put in a lathe are filed. They are then polished. First rough polished, and, second, glossed off, or smoothed. This is done by holding the metals against rapidly revolving wheels of brushes or bobs of various sorts and sizes. These brushes, according to the work to be done, are made either of "swan down," bull hide, or rhinoceros skin, as the case may be, aided by a powder of rotten-stone and oil.

The Messrs. Hardman have just made a magnificent railing in brass for Worcester Cathedral. It is 32 feet long, and folding doors are added. For such a work a pattern is first cut in wood.

The author from whom we have quoted gives the following description of the method of making of a chalice and paten, which, like the rest of the work, is done by hand. For the bowl of the chalice a disc of the required size is cut from a piece of silver. It is now a round piece of perfectly flat metal. The workman then places it on a round leather bag filled with fine sand, and beats it in the center with a round headed hammer. The leathern surface gives way to the blows and the bottom of the bowl is roughly formed. It is then held by one hand on a steel stake, on which it is beaten with a steel headed hammer on that part which will form the center of the bowl. The top part is then beaten by a hammer made of buffalo horn. The object of these various operations is to produce the proper shape, and to add to the strength of the silver at the top part of the bowl. This is effected by the peel-headed hammer, which beats out the metal in the middle part, graduating it toward the top or rim. The buffalo horn hammer merely flattens, and does not beat out the metal. After being thus beaten the bowl is annealed by a gas blow pipe, softened, cooled and then beaten again. In this second course a "bouge" hammer is used in place of the peel-headed one. In this operation the marks made by beating out the middle part of the bowl are smoothed out, and when a third course of beating, called "planishing," has been performed, this part of the bowl, both inside and out is made quite smooth and bright, and the top part has been considerably strengthened. Similar operations, with necessary variations, are gone through in making the foot, the knops and other parts. The knops are fastened on pitch, and the ornaments are then engraved. Both in engraving and chasing here the patterns are produced by the skill of the workman, and his mastery over his tools, which are entirely without pattern. In most places the pattern to be cut is on the tool, and then hammered into the metal; here it is cut by hand, that is, it is truly engraved or chased, as the case may be.

Making a paten is a very simple, but still a skillful, bit of work. A disc of gilding metal (for German silver is not here used for any article) is cut. A small "swage" is fixed into a vise, in the fixed part of which is a gauge of the required width of the rim of the paten. On the movable part is a small hammer, the workman passes the disc of metal round, skillfully working the hammer so as to produce the ridge of the paten. This is repeated, and in the last time, by suspending a weight over the "swage," the dents previously made are smoothed, and the paten is ready for finishing.

Another branch of art carried on in this establishment is that of jewelry made to special design. Brooches, bracelets, ear-rings and other articles of ornament, are fine examples of art work. A bracelet of which the pattern is produced by enamel on enamel is a very fine bit of work. Nearly all the enamel done here is that known as *champleve*, the *cloisonne* seldom being adopted. Emblematic brooches are among the specialties. The author saw a fine example of this for the name "Thornton," which was produced by thorns and a ton, in gold work of a very superior kind. Some admirable examples of *niello* were also shown, as well as all kinds of mediæval metal work. Everything in brass required for the complete fitting up of a church or for domestic use is exhibited, and hours, even days, would be required thoroughly to examine the rich store of art manufacture, whether in metal or stained glass. Of working in metal Mr. Aitken has well said, "the restoration of this art in its integrity has been effected by the earnest labor, sacrifice and love of John Hardman; and at the cost of a precious life, that of Augustus Welby Pugin." And it would seem that Birmingham has largely reaped the advantages of their labor.

Tipping Hook and Lid Lifter.—It is not to be expected that the readers of *The Iron Age* should have had much practical experience in pouring out the contents of boiling kettles, but, perhaps, all will readily appreciate the fact that the operation is attended with great inconvenience when only the usual appliances are at hand. Those having occasion to handle a steaming kettle will be glad to learn that it may be accomplished without danger of being burned in the operation. A simple little device for holding the kettle has been invented, and is now being manufactured by the American Manufacturing Company, of New Haven, Conn. In form it is similar to ordinary stove lifters, with the addition of a hook, which adjusts itself to any kettle. It is serviceable in removing a kettle from the fire, and in pouring out its contents, for which purpose it may be used without danger of its slipping. Holding the kettle with one hand, and with the other adjusting the hook to the edge, the latter is held so securely as to form a firm handle, by means of which it may be tipped to any position with ease. As a lifter for stove lids it is similar to the best patterns of ventilated cast iron lifters in market, and can be furnished at nearly as low a price.

The Great Street Car Builder.—The New York correspondent of the Boston *Journal* says: John Stephenson is the great street car builder of the city. He is now over sixty; as hale and vigorous as when he was thirty; under sized, stocky, robust and cheery; a mechanic of the James Harper school. He makes cars for the world. No nation can compete with or undersell him. While I was talking with him he was making a contract for cars for Bombay. Twelve cars were ready for Liverpool. Others were on the wagon for London. Another lot are for Australia, Norway, Austria, St. Petersburg, and also America, and over our boundless Continent. Liverpool cars are double deckers. But Americans won't ride in them. All English cars have the windows fastened down, and they can't be sold unless they are. These cars the English cannot make, though they have had the pattern for a number of years. Nor can that wonderful nation make a rubber car spring. All are made here. Mr. Stephenson ships no cars. He delivers all his work in New York. Each nation, company, or man who trades for a car pays for it in New work. No contract is taken unless the contractor has a banker in New York who will pay for the car when it is done. Mr. S. builds nine cars a week. He can take an order and have a car ready to ship in four days. Each car costs $1000, gold.

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Bed Screws, Pin Hinges, and Wire Nails a Specialty.

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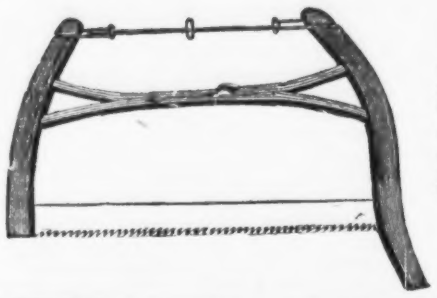
MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
Sole Proprietor & Manufacturer,
VULCAN SAW WORKS,
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AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

Patent Secured

PATENT HANDLES AND GAUGE INCLUDED.

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG. **E. C. ATKINS & CO.**
Saw Manufacturers and Repairers, Indianapolis, Ind.

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HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.

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Double Edge Sooke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

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Commission Hardware,

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AGENT FOR

American File Co.'s Files.
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M. S. Brooks' Screw Eyes, Hooks, &c.
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Thrall's Try Squares, Bevels and Rules.
J. P. Verree's Hammers and Edge Tools.
Judd & Blakeslee's Snaps, Sash Fasts, &c.
H. Wilkinson's Mincers and Screw Drivers.
Bliss & Co.'s Hand and Bench Screws.
T. T. Rhodes' Saw Handles.
American Screw Co.'s Rivets and Screws.
Stillman's Saw Sets.
Dodge's Kentucky Cow Bells.
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C. S. Griswold, Augers and Bitts.
Romer & Co., Pad Locks.
Wm. Cleveland, Star Faucets.
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Cowles' Hardware Co. Mincers, &c.
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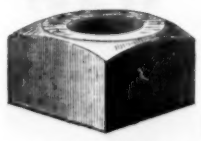
NEW HAVEN NUT CO.,

MANUFACTURERS OF



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Of Superior Quality of all sizes, both

HEXAGON & SQUARE,

From ¼ inch to and including 1¼ inch Bolt.

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Wheeler, Madden & Clemson MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

TO HENRY DISSTON & SONS:

Philadelphia, Pa.

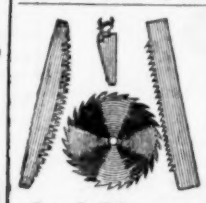
I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

Henry Disston & Sons, dare not respond.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?



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Manufacturer of

ALL KINDS OF

SAWS

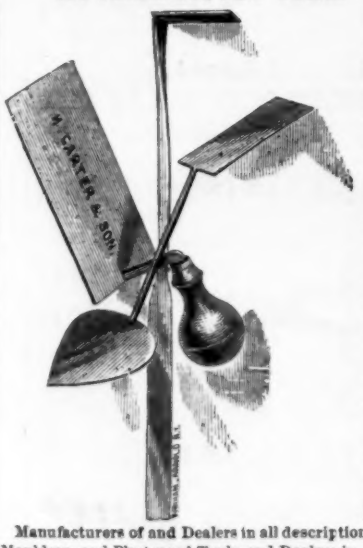
And Plastering Trowels,

ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

H. CARTER,

290 PEARL ST., NEW YORK.



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CARTERS' PATENT CARRIAGE LIFTING JACK, &c.

Moulders' and Plasterers' Tools.

make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

VAN WART, SON & CO.

Hardware Commission Merchants.

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At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

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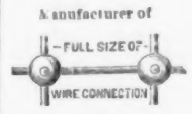
Patented,

June 8, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.

Manufacturer of



JAPANNED and PATENT EUREKA Bright Metal

BIRD CAGES.

Nos. 247 & 249 Pearl Street

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LE COUNT'S

Pat. Machinists' Tools.

REDUCED PRICES.

Set Iron Dogs,	⅜ to 2 in.		$ 5·60
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Iron and Steel Clamps, Die Dogs, Clamp Dogs,

Vise Clamps, Expanding Mandrels, &c.

Send for latest Price Lists to

C. W. LE COUNT,
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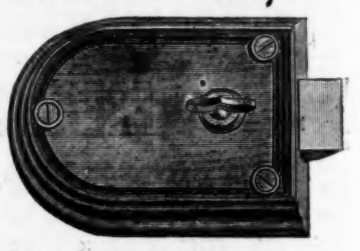
AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

Locks & Latches,



Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with

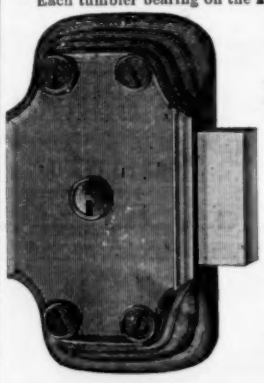
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust,*** and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs, which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

For descriptive list and terms, address

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Or, UNION NUT CO., Agents,

78 Beekman Street, New York.

Bemis & Call Hardware & Tool Co.

This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

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Have Opened an Office at

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BUTCHERS', COOKS', AND HUNTERS' KNIVES, Etc., Etc.

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NORTHAMPTON CUTLERY CO.,

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TABLE KNIVES AND FORKS OF **ALL** KINDS,

AND ORIGINALLY EXCLUSIVE MAKERS OF

Also the exclusive makers of the "**Patent Ivory**" or Celluloid Knife, which is the most durable **White Handle** Knife known. These Handles never **get loose.** Always call for the "Trade Mark"

"MERIDEN CUTLERY COMPANY"

on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

PATENT FINE PEN & POCKET CUTLERY

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The **only Knives made** that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife.** We also make

NICKEL & SILVER PLATED POCKET KNIVES

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Naugatuck Cutlery Co.,

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PEN and POCKET CUTLERY.

FULLER BROTHERS, Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

JOSEPH RYALS, Collinsville, Conn.,

Manufacturer of **Patent**

SHEARS & SCISSORS.

Made by a new process **RECENTLY PATENTED** which enables me to produce goods that in quality, finish and general excellence surpass any. *All warranted Solid Cast Steel Blades.*

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Manufacturers of *SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET, and other Handles.* Full assortment always on hand.

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WARRANTED TO BE MADE OF THE BEST MATERIAL.

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Silver & Deming's Coach Machinery, Iron and Wood Truss Hoops, all sizes.

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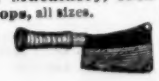

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Manufacturers of **Albata & Britannia**

TEA and TABLE SPOONS,

Caster Frames, Ladles, &c.

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Established 1837. Manufacturers of Patent Scandinavian or Jail Locks. Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Piano and Sewing Machine Locks. 141 to 145 Railroad Avenue, NEWARK, N. J. Illustrated Catalogue sent on application.

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AGENT FOR

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Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.

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Granted 1777

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The demand for **Joseph Rodgers & ons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam wer.

To distinguish Articles of **Joseph Rodgers & Sons'** Manufacture, please to see that they bear their Corporate Mark.

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AMERICAN

PEN AND POCKET KNIVES,

MANUFACTURED BY Aaron Burkinshaw. AB *PEPPERELL,* MASSACHUSETTS

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass Mechanics' Ass'n Sept., 1869.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Nov. 8, 1875.

The elections over, their effect on the financial question is now the topic in business circles. Most believe that no action will be taken by the next Congress to change the operation of the bill for the resumption of specie payment, but that it will be given a fair trial. Some business men look forward to an early and immediate improvement, now that the inflation ghost is laid, but the majority confess that they see nothing but time to overcome the effects of the commercial disasters through which we have passed. But whatever may be the condition of other cities, Philadelphia is far from being dull in any sense. Commerce, manufactures, building and all their kindred industries are active. There are in port and loading for foreign countries 113 vessels, of which, 16 are steamships. The export grain trade is again improving; the petroleum export rapidly resuming the dimensions of former years—our elevators are busy, and a new one just completed capable of holding 800,000 bushels or over 20,000 tons of grain. The manufactories which give employment to over 120,000 persons with annual wages amounting to nearly $250,000,000, and which produce goods to $350,000,000 annually in value, are generally busy, the dress goods and fine textile fabric mills running now half the night. Notwithstanding the total destruction by fire of one of the largest mills in the country, here last week, the proprietors show not only their pluck, but their orders on hand, by immediately advertising to rent 200 looms. Two dry docks are being erected, one of which has a larger pumping capacity than any other in the United States, being 120,000 gallons a minute. One of the new warehouses is capable of storing 35,000 bales of cotton, or 1,000,000 bushels of grain, which will be increased to 4,000,000 bushels, with facilities for loading *twelve ships at one time.* Free wharfage attracts vessels from all ports to these facilities. One of the finest cotton presses of the world has just been finished, capable of pressing a bale a minute. Building is rapid on all sides, no less than 608 permits being issued for new buildings in October, and 7608 since the new year. The Centennial, the public buildings and the new post-office all employ large forces. With such a list of evidences of activity who shall say that Philadelphia is suffering from depression?

The iron shipbuilding trade is well reviewed in the *Evening Bulletin* of late issue, which gives the history of the trade on the Delaware very fully, and its present condition also. The Cramps are working 600 men, and have just finished repairs on the South Carolina of the Clyde line. The St. Paul, for the Alaska Co., 1100 tons, is nearly done, and the double turreted monitor Turoxis has just been rebuilt. The Crams have built 197 vessels at their yards, valued at fifteen million dollars. The Harland & Hollingsworth Co., of Wilmington, have the credit of building the first iron ship in the United States in 1844—the Bangor—run on the coast of Maine, and in 39 years have constructed 168 vessels, of which the value was $17,000,000

The iron ship works of the Reading Company, at Port Richmond, are all ready except the dry dock, and comprise a machine shop 497 by 124 ft.; boiler shop, 220 by 60 ft.; flanging shop, 90 by 30 ft.; plate bending shop, 58 by 68 ft.; molding and joiner shop, 310 by 60 ft., with draughtsman's room 260 by 60 ft., and Smith shop, 154 by 54 feet. All these buildings are of brick and iron, and stocked with the latest machinery. There are two wharves, each 100 by 400 ft., between which is a launching dock 250 feet wide, with ship ways 450 ft. long at the end, admitting of building four vessels at once. The Penn Works, of Neafie & Levy, are busy on the United States steamship Quinnebaug, have just finished two gunboats for Hayti, and have much work on hand. Wood, Dialogue & Co., at Kayton's Point, are also busy in iron work. To show that Roach, at Chester, is up and doing, the telegraph announces that on Nov. 6 twenty-eight cars loaded with the hull of an iron ship for the Pacific passed through Harrisburg for California, and twenty car loads more were to follow. Did any one but an American ever send a ship across a continent on a railroad? From Wood, Dialogue & Co.'s yard the extremely powerful wrecking steamer North America was launched this week. She is almost all iron, nothing but decks being wood. The keel is 7 by 2½ in. hammered iron from 4 by 3½ angle iron, and her plating nine sixteenths thick. The engine is high pressure condensing, 42 by 40 inch cylinder, and drives an 11 feet propeller. These items show that iron shipbuilding is not among the depressed industries. Nor are the railroads behind. The Pennsylvania R. R. is doing more freight business on all its lines than ever before, and is continually arranging new facilities. Among these are a second fast mail from New York daily west through to St. Louis, reaching that city in 60 hours, and a new fast mail to New Orleans. Also arrangements have been made to run through cars from Washington to Boston *via* Penna., N. Y. & N. H. and Springfield routes. The cars will be run on a boat at Jersey City and carried up the river to the Hudson River R. R. connection with the New Haven Road. This last will be quite a novelty in railroading, but will scarcely work with the ice in the river.

The Inman line of steamers have dispatched the City of Limerick from Liverpool to this port, and will place additional steamers on the route. The Great Eastern is chartered to bring Centennial goods here from Liverpool, and will run with passengers during the exhibition. Our people have abandoned the idea of being able to supply the travel by the horse cars during the exhibition, and now propose steam direct from the heart of the city to the grounds.

As an earnest of hotel provisions, one hotel alone, now building, covers five entire squares, and consists of *ninety* first-class, four story dwellings, connected during the *show*, and to be sold as residences after, all opening on an elegant park. And as for rents, $75,000 for 60 days was offered for the Bryn Manor Hotel, 10 miles from the city, by the Nevada delegation, and $100,000 asked, which has since been overtopped, it is reported, by an offer for it for the German Crown Prince and suite. The American restaurant will be a feature. It will seat 5000 persons at tables and table equipage strictly American; and your stove men can come and see a cooking range *forty feet long* in its kitchen! So much for the novelties and the actual life in and around Philadelphia.

The Southwark Foundry, formerly Merrick & Sons, later Henry G. Morris, last of the sheriff, was sold at auction during the week, and it is reported was bought by the Merricks for $291,000, with a mortgage in their favor on it for $322,000 more. So ends this ill advised venture in business by a man who at an early period in life had retired from business with the moderate competency of $750,000.

The Attorney General of New Jersey is striving to prevent the construction of the new railroad to New York, by enjoining the completion of the bridge over the Delaware at Yardleyville, and the case is attracting great attention, but will, it is believed, be decided in favor of the railroad company.

The Franklin Institute has lately greatly increased its library, reading, drawing and lecture rooms, and announces a highly valuable course of scientific lectures for the winter on acoustics, gas lighting, mathematics, mineralogy, artificial ice, life, motion, meteorology, electricity, telegraphy, construction of steam boilers, geology, lenses and optics, chemical forces, etc., etc.

The English papers herald as new the invention of one Baker for refining iron by means of a runway between the blast furnace and casting bed, through the sides of which air is injected into the molten iron. This was done at Dunbar Furnace, Pa., two years ago, by Mr. Pechin, under Wickersham's patent, and is no novelty at all. Subsequently an inventor, seeing the partial improvement, improved on this by making the runway a flight of steps, down which the iron ran, and which steps were perforated with air blast passages; the design being to have the iron decarburized, as well as purified, by the time it got *down stairs.* But neither worked well enough for general adoption.

An evening paper on the 5th published a grave editorial, claiming to have, in the person of its editor, "stood by the Keeley motor in company with a judge of the Supreme Court"—a queer judge of motors, by the way—and to state that the new force was *bona fide* and all it was claimed, following these statements with a long rhetorical flourish upon the effects of the discovery upon mankind. To night it says it was simply a joke! Such elephantine witticism, which makes a lie the point of humor, is reserved for some classes of journalists. Humbug or reality, the Keeley motor is progressing. Not long since, Shaw, the most fertile inventor of the nineteenth century, constructed a pressure gauge for it to indicate a pressure of 55,000 pounds, and now the Chester Steel Casting Company have made a hollow sphere of steel, sufficient to resist no one knows how much pressure, for it. Evidently it has money, friends, believers and backing, and with these adjuncts most things, humbugs or not, succeed.

The Eastern Iron Masters, at their late meeting in your city, through their secretary, enunciated some remarkably strong common sense, the gist of which is that iron is made as cheap now as it ever can be (probably), and consumers need not wait for better prices—which is all so.

Railroading in 1829.

The letter from which we make the following quotation, was written by the gifted Catharine Stanley, wife of the Bishop of Norwich, and mother of the celebrated Dean Stanley of the present day, to her sister, and bears date of December 19, 1829.

On Wednesday, when we were at Lathom, came an express from Knowsley, saying there was to be a railroad exhibition that day near Prescot, and the Liverpool tunnel lighted up for Lords Harrowby and Sandon next day. So we got off as soon as we could, and drove straight to the railroad at Prescot, and there found Charlotte and Penrhyn, and the wonderful locomotive engine flying past. To us, who have no turn for these things, and therefore do not or cannot realize any description, the seeing them comes with such novelty and force, and brings such a train of new thoughts—this thing, which is to convey carriages, people, goods, everything, from Liverpool to Manchester, thirty miles in an hour, ruining half the warehouses of Liverpool by making Manchester into a seaport town, the goods landed at the docks at Liverpool being henceforth transported at once to the warehouses at Manchester in as short a time as they now take in being carried from the lower to the upper part of the town.

The effect of the velocity is that when you stand on the railroad and watch the machine coming, it seems not to approach, but to expand into size and distinctness, like the image in a phantasmagoria. They would not take any car for passengers that day, as it was a newly constructed engine, and they were only trying; but it gave one a sensation seeing it whiz past! The next day at 10 o'clock, Penrhyn, Edward, Mr. Stanley and I, set off in the Derby coach and four for the tunnel, which is at the end of the aforesaid railroad—an excavated vault of a mile and a quarter under the town of Liverpool, coming out at the docks. Lord Harrowby and Lord Sandon were just arrived, with Adam Hodgson, one of the directors of the said tunnel, Scoresby, of the Artic regions, James Hornby—altogether about twenty of us. We went first to see the carriages in preparation for the railroad. I had no idea it was all in such a state of forwardness. They are like the omnibus, a coach with a chariot at each end, some fit for twenty, some for thirty passengers; also cradles for pigs, cattle and goods, and platforms with railroad wheels, upon which you may drive your carriage and horses as into a steamboat, standstill, and be transplanted as upon the fairy carpet for thirty miles while your horses are baiting, ready to drive off and take you on, and making a ferry of it.

They are now thinking of continuing the tunnel under the Mersey, so as to supersede the real ferry altogether to Seacumbe. This seen, we got into a kind of German post-wagon (all twenty), a horse cantered with us up the little tunnel, as they call it, and then was taken off and we were launched into the great tunnel, a vaulted passage lighted with lamps suspended from the center, a slight push sent us off, and away we started at the rate of thirty miles an hour, our speed increasing as we went on, perceptible only from the strong current of air and the passing the lamps so rapidly. I never felt so strange, so much in a state of magic, of enchantment, as if surrounded by new powers and capabilities. In less than three minutes from having entered the tunnel in the country, we came out on the other side of Liverpool at the docks. The first effect of daylight was beautiful, and of finding ourselves we did not know where, after the rapid motion, bewildering. We got into our coach again grumbling at McAdam roads, and the Derby pace of ten miles an hour; Edward lamenting his hard fate at being fifty years old at the beginning of such things. Mr. Stanley amusing in his speculations as to the effect of these things in various directions. I tell you all this because you in the south must be in a state of comparative blindness and darkness, and you will hardly believe, as I did not, what is doing till I had seen it. I dare say Augustus will like to know it all. Alas, at this moment you have not him to turn to, not that I pity you one bit. I do enjoy complete solitude and freedom so much myself, that, though you have a great privation to set against it, I am sure you have a sister feeling about it.

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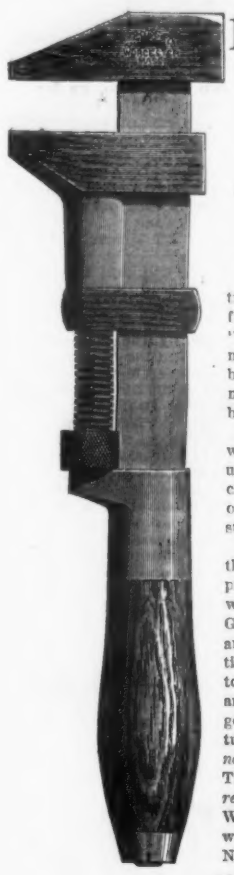

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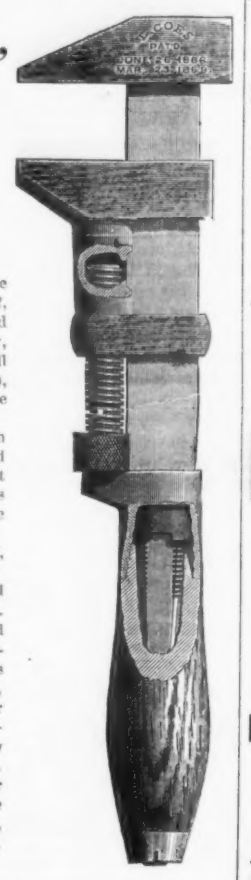

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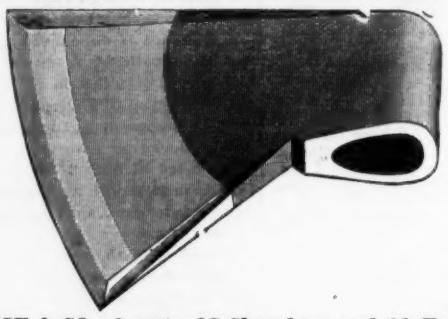

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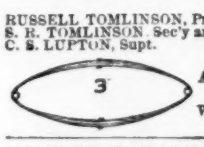

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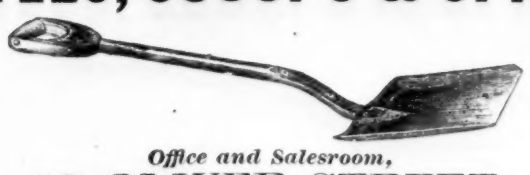

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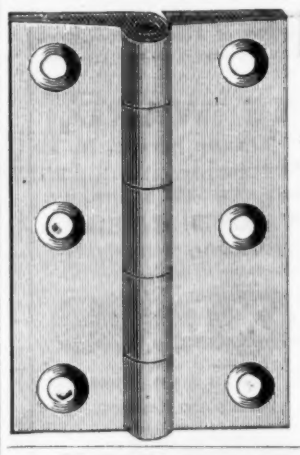

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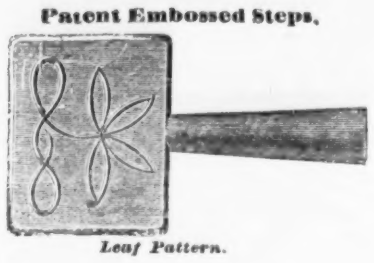
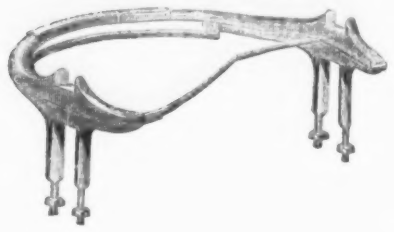


Leaf Pattern.

King Bolt Yokes.

No. 6 Fifth Wheels.

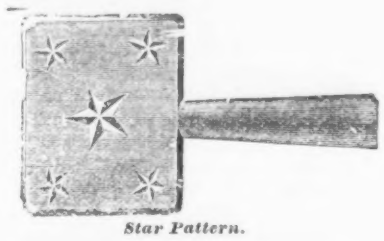


1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.

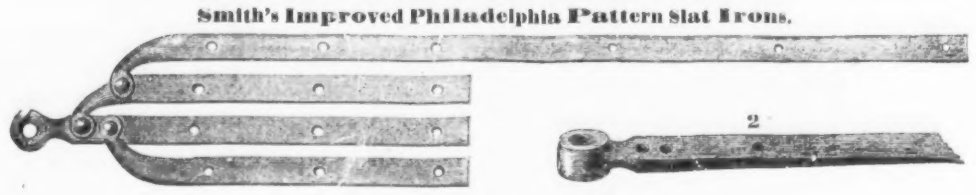
Upper View.

Lower View.

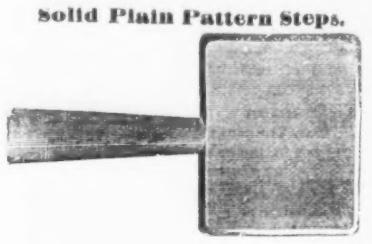


Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.



Solid Plain Pattern Steps.



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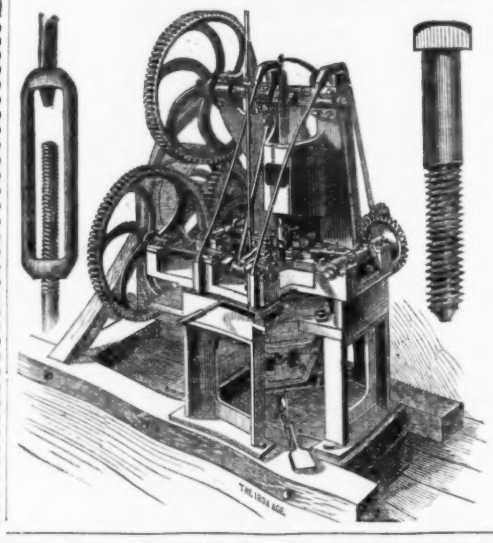

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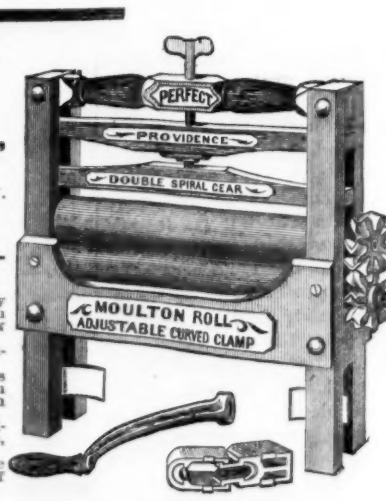

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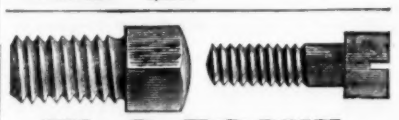

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JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

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Steel as a Material of Construction.

The address of Mr. A. L. Holley before the American Institute of Mining Engineers, printed in another column, will be read with interest. Hr. Holley is evidently impressed with the belief that steel is about to supersede iron in many important uses for which the latter is now generally employed. While the use of soft steels in this country is still limited in great degree to the manufacture of rails, the more extensive employment of this grade of metal in Europe warrants the belief that we shall soon find it profitable to more generally employ steel as a material of construction, at least when the product shall be great enough to meet an increased demand. Mr. Holley points out the means by which the development of our steel industries can be secured and the cost of the product cheapened, and his paper will no doubt receive the careful and intelligent attention of manufacturers. A few remarks on the uses of steel, in addition to those for which he has found room in his paper, may also be interesting to the general reader.

Since the improvements of Bessemer, Siemens and others have rendered possible the production of large masses of steel, approximately uniform in quality and cheap enough to admit of its employment on a large scale, steel has acquired a new and steadily increasing importance as a material of construction. It is now required in large masses by the engineer and machinist for use in structures and engines subjected to strains beyond those which can safely be placed upon iron. Steel thus employed must possess such toughness that it may be bent cold or twisted without injury to the fiber, its tensile strength should be at least 50 per cent. greater than that of good wrought iron, and it must be soft enough to admit of being hammered, bored, chiseled and filed. These conditions have been met in the Bessemer and Siemens-Martin steels, which are obtained in large masses and, without subsequent manipulation, other than that required to shape it, possessing a high degree of toughness and strength, and develop no tendency to fracture under any conditions to which they could be exposed in engineering structures. Such qualtities give steel exceptional value for employment in connection with cast iron in architectural work. Pillars of cast steel have been found to possess many advantanges over those made of cast iron. Owing to the greater strength of the metal, they can be made much lighter than iron, consequently taking up much less room, while, owing to their toughness, they can safely be loaded to a point very much nearer the breaking strain than is possible with iron. If so heavily loaded as to cause them to bend, they will return to their original position as soon as relieved of the pressure, without injury or loss of elasticity. Steel columns are also superior to iron from their greater ability to resist sudden strains or blows. Another very important advantage of steel is its ability to resist without injury temperatures which would cause cast iron to crack and crumble. In case of fire, a steel column will carry its load under all but exceptional circumstances, and cold water thrown upon it will not crack it,—qualities which cannot be claimed for cast iron. For beams and girders, steel is better than iron in proportion to its greater stiffness and strength. When steel is used in supporting floors, a given weight of that metal will probably possess as much strength as double the quantity of wrought iron, since the supports may be considerably deflected without losing their elasticity, and may be loaded to very near the limit of flexion without danger of fracture. Steel also makes a very light and durable framework for roofs, and possesses the important incidental advantage already noted, of being able to bear exposure to very high temperatures without being twisted or destroyed. These are a few of the many uses to which steel can be employed in the construction of buildings, and our architechts will not be slow to appreciate the important advantage of that metal when the development of the steel industry shall have placed it within the reach of all classes of large consumers.

Among the other uses to which cast steel can be profitably put, may be included in a general way, and with but few exceptions, all forms of constructive engineering requiring a metal which is tough, ductile, tenacious and able to bear severe transverse strains. In Europe it has been used in parts of machines where it was desired to combine lightness and strength; and steam boilers have been made of steel plates five-sixteenths of an inch in thickness, which have safely carried a working pressure of 100 lbs. to the square inch. It has also been used for locomotive boilers, for which it is well adapted, as the toughness of the metal admits of the punching of rivet holes very close together. Locomotive fire boxes are also made of steel, in one piece, rolled out from an ingot and hammered up, without joints or seams. Steel is also coming into use as a material for ship plates, the tests to which it has been subjected in naval construction having shown it to possess many important advantages over iron. Its minor uses are so many and various that we cannot attempt to mention such of them as have come to our notice. They are of sufficient importance, however, to encourage the fullest development of the steel industry in this country, as well as to prompt to such careful and intelligent experiment and investigation as may lead to a cheapening in the price of steel, until it shall become available for a wider range of application than has yet been given it.

We would caution those who may be induced to follow foreign examples, however, not to be misled into the belief that all steels are good for uses to which some steels have been found peculiarly adapted. In boiler plates we need strength, but beside this it is necessary that the plates work easily, so that the danger of spoiling may not be great. After flanging, if annealing has to be very carefully performed, or if the metal, under the action of the fire, grows brittle with time, it is evident that it is not of the character desired. In ship plates, uniformity is one of the essentials. When the strength of a lot of plates ranges from 15,000 to 55,000 pounds per square inch, it is evident that, with a proper margin for safety, the ship would be no lighter than one of iron. Variations as wide as this are on record, and shipbuilders in this city, when desiring to build and wishing to use steel, found such a difference in the strength of the different plates, that, without testing each separately, the work would have to be heavier than though iron was used. Hence, to make the use of steel an object to the shipbuilder, he must be able to depend upon the tensile strength of every plate; nor must the hardness of a plate be forgotten. Sometimes one plate may be hard and another soft, a variation just as dangerous as the lack of strength. Such a want of uniformity entails the necessity of either testing every plate, or abandoning the use of steel altogether. In ship plates, evidently a very different material is needed from that used in a locomotive fire box. In the one case, after being worked into shape and fastened in place, it is not subjected to great changes of temperature, nor to the influence of a sharp flame. In the locomotive, on the contrary, the plates are not only exposed to the intense heat of the fire on one side, but upon the other they are in contact with the water, and it is not to be wondered at if both chemical and mechanical changes take place in the metal. The steel railway tire presents an entirely different problem to the steel maker. First, an exceedingly hard surface is wanted. Considered in itself, it would be judged impossible to go to excess in this matter. On the other hand, strength is needed to prevent the tire from bursting from the strain of fitting. It must also be strong enough to resist the shocks which it receives on the road. The hardest, toughest material is what is wanted in this case, and the tire of the present day is a sort of compromise between the two. A tire that is tough enough to stand the strains to which it is exposed, has hardness enough to enable it to resist wear to a reasonable degree. For many kinds of wearing surfaces a steel almost as hard as fire and water can make it is desired. Strength is little looked after, providing the metal will take a hard face and warp but little. In other words, a wearing metal is needed, and the strength is of little moment. Mechanical tests enable us to select from a number of samples that which is the nearest like what we desire for a given work, but they give not the slightest hint as to what the various properties of the steel are due, nor does it enlighten us upon the behavior of the metal when exposed to heat; nor when we attempt to reproduce a given sample, does our previous test give us any light upon the best way of accomplishing our object. It is upon chemistry alone that we must rely for this information. Mechanical tests will tell us in a most satisfactory manner when we have obtained the desired end, but the method we must follow to insure the production of metal of uniform grade, or of a special quality for special uses, can only be determiued in the laboratory.

The Proposed Hudson River Suspension Bridge.

The company organized some time ago under the name of the Hudson River Suspension Bridge and New England Railway Company, are again bringing to public notice the plan, long ago proposed, of spanning the Hudson River with a railway bridge. A board of engineers, appointed to consider and report upon the location, decided that the best point at which to span the river would be between Fort Clinton and Anthony's Nose. This point was chosen, and surveys have since been made for the various railroad connections which are proposed or decided upon. The plan of the bridge has also been perfected, and everything seems to be in readiness to proceed, so far as engineering preliminaries are concerned.

Of the financial prospects of the company we have no trustworthy information. Several times the announcement has been made that capital had been subscribed to an amount sufficient to carry the work forward to a point from which it could be completed, in the absence of other subscriptions, with capital borrowed on the strength of the company's legitimate commercial credit. How this may be we cannot say, but there certainly should be no serious difficulty in raising money enough to build a work so necessary, and considering the comparatively small investment required, with as good chances of profit as such a bridge offers. A bridge across the Hudson, as near New York as possible, has become a commercial necessity. The great volume of exchanges between the New England States on the one hand, and the Middle, Southern and Western States on the other, must now be subjected to costly and inconvenient trans-shipment at the Hudson River, except that moved by the lines which can avail themselves of the bridge at Albany. The coal traffic between Pennsylvan a and New England would alone justify the construction of a bridge across the Hudson at the lowest practicable point, and when to this is added the passenger and miscellaneous freight traffic which would naturally pass over a bridge thus situated, there would seem to be no doubt but that the revenues would be sufficient to pay interest on the cost of a bridge economically built by competent engineers.

The Tunnel Under the English Channel.

Ever since the Norman conquest, the enmity between the English and French has been proverbial, yet, in spite of it, they have for a hundred or two years been constantly agitating some scheme by which the barrier which the English Channel puts between them could be removed. Though the Straits of Dover at the narrowest part is only from 18 to 25 miles wide, averaging 22, yet from its roughness and the strength of the tides and its shallowness, it has opposed a barrier to navigation out of all proportion to the distance between its shores. The very character of the seas around Great Britain and France have unfitted the naval architects of either country to successfully meet the question of navigating this narrow strait. Accustomed to build seagoing vessels fit for heavy weather in deep water, where the roll of the sea was comparatively long, they could not, either by experience or theory, produce a comfortable vessel to meet heavy weather in shallow water. The channel steamers were and are only diminutive ocean vessels. The result is, that the passage of the channel is more dreaded than a voyage across the Atlantic, and really there are more discomforts crowded into its few short hours than into many a longer and more dangerous passage.

When the tunnel under the channel was first proposed, or who proposed it, seems to have slipped from men's minds; at any rate it is a matter which has occupied the idle minds of Europe, and some of the busy ones also, for many years. One of the earliest scientific articles which we remember was upon a bridge, or tunnel, or both, by which England was to be connected with France. The early projectors indulged in the most wonderful visions as to the usefulness of the projected tunnel, and painted most glowing pictures of the manner in which the thing was to be accomplished. One of our latest foreign exchanges has the following item which shows that the scheme, wild as it may seem at the first glance, is not too wild to prevent men from putting money into it.

"It is reported from Paris, that next week the preliminary operations prior to the commencement of the famous submarine tunnel will be begun. The members of the French Commission, composed for the most part of practical men and engineers, declare that an underground communication between France and England is only a question of expense, and the report they have drawn up and submitted to the French government, with the result of the soundings and the study of the geological strata, leads to the belief that the project can be carried out with less expense than was at first imagined, and that the danger of leakage and infiltration will not be so great as was originally supposed. A shaft will shortly be sunk on the French side of the channel, near Calais, to a depth of 350 feet, for the purpose of hauling up the earth and rock from excavation."

As a mere matter of engineering, there is nothing impossible in an 18 or 20 mile tunnel under the sea. In this case, from all that is known of the bottom, we are led to suppose that it is good, being firm enough to keep out the water, and sufficiently soft to make the work easy. The depth is small, from 6 to 29 fathoms being given as averages, though in places it is much less. The cost has often been estimated, but the figures are too large for comfortable contemplation when we think that the work is expected to earn interest upon a sum that sounds like a small national debt. We do not doubt that the work will be undertaken, and possibly finished, and be one of the engineering triumphs of the world, and at the same time one of the world's commercial failures. Somebody must furnish the money and somebody will look for interest on the investment, but a hole under the sea 22 miles long, with a double track railroad, even if it be the connecting link between two populous countries, cannot be depended upon to pay an unlimited interest account. Possibly the passenger business would be large, but of this even there are doubts. In freights the matter would be better, and yet the competition would be sharp and the amount of traffic that could be carried through such a tunnel is necessarily limited. If there were any prospects that there would be anything like engineering economy in the management of the enterprise, we should have some hope for it, but it must be classed, we fear, among such memorable ventures as the Great Western and Great Eastern—successes which were failures. But the tunnel is not the wildest scheme that has been proposed for avoiding the dreaded channel passage. Some years ago it was seriously proposed to build a bridge across the channel. It was, if we remember rightly, to be made of such hight that a ship with her royal yards crossed, could pass beneath the roadway. Lighthouses at intervals were to be established, and, taken as a whole, it was to be one of the world's most stupendous engineering marvels. In a somewhat more modest way, English naval architects have been at work trying to solve the problem of channel transportation, but with little success, since the Bessemer, saloon and all, is laid up, and we believe offered for sale, or shortly to be sold. The Castalia, though better than nothing, is too slow, and with these attempts the naval architects seem content.

Though the tunnel is the next thing, there are many things in connection with it that cause engineers some apprehension. First, is the question of how it is to be worked. Locomotives could do it, of course, but then how could the smoke and steam be got rid of? Ventilation in such a long tube is by no means a simple matter. Shorter tunnels have long before this given much trouble, and as but few ventilating shafts will be practicable, the matter becomes very serious. Fireless locomotives are proposed, but these use steam, and exhaust into the air, which, if many trains per day are run, would soon saturate the atmosphere. The channel passage may be very bad, but whether tunnel transit under the channel will be any safer or more comfortable is, at best, doubtful.

The Threatened Scarcity of Plumbago.

Plumbago, which has many special uses in the arts, has become, during the past fifteen years, a very important article of import into this country. The greater part of that consumed in the United States is drawn from the island of Ceylon, and as showing its increasing value for manufacturing and other purposes, we may mention the fact that the exports of that country have risen from 82,000 cwts. in 1871 to 169,000 in 1873. Last year, owing to a growing scarcity of the supply, they declined to 137,000 cwts. The shipping season begins Oct. 1st, and from that date last year to the 1st of October instant, there had been shipped from Ceylon to the United States, 29,893 cwts., against 37,668 last year. The total export of the island this year has been only 90,641 cwts., and as the article was scarce, it is probable that the total amount supplied during the next twelve months will not much exceed the shipments of 1871. Unless, therefore, the consumers of plumbago are well stocked from former importations, it is probable that an increased consumptive demand will cause a scarcity. This possibility gives interest and importance to any facts looking to the development of new sources of supply.

Some months ago we called attention to the statements made in the Mexican papers concerning extensive deposits of plumbago discovered at Zimapan. We have lately read a letter from the owners of these mines to a prominent firm in this country, which confirms the early reports; but while these Mexican mines may be all that is claimed, the freight on their product is too high to the places of shipment to admit of its finding a profitable market here in competition with East Indian plumbago, and their development will have to await the presence of better facilities for carrying it to the coast.

From England we have recent and important advices, giving promise of a revival of plumbago mining in that country. A large quantity of plumbago has been discovered in the ancient and once celebrated Barrow Vale mines, and operations were at once undertaken for the extraction of the mineral and its preparation for market. The plumbago is found in these mines in great masses, but although they have been worked since the early part of the seventeenth century, operations have been confined to the driving of tunnels into the hill, without any attempt to reach the deposits lying upon either side. The lessees of the mine are confident of a large and sustained production, and are about to erect large works near at hand for the manufacture of lead pencils. As this plumbago is of especially fine quality, it

will probably be absorbed in the manufacture of pencils and for use in the arts; it is probable that, until the Mexican deposits are rendered available by the opening of new routes of overland transportation, we shall be compelled to rely for the ordinary grades chiefly upon the failing production of Ceylon. There is plenty of low grade plumbago to be had, and probably some of this can be utilized in case of a scarcity of Ceylon. In this country we have an abundant supply, but much of it is of inferior quality. A large lump of plumbago, of exceptionally good quality, however, was lately sent us from a newly opened mine in Connecticut, and we have no doubt that, in case of scarcity, much of the demand for Ceylon could be filled from domestic sources, if proper facilities for working it were provided.

There must be something uncommonly stimulating about "cold vapor." A reporter of the Philadelphia *Bulletin*, who has been to see the Keeley motor, writes as follows concerning that most remarkable invention: "To stand and look, as "we stood and looked, at the workings of "this mighty force, in the presence of one "of the Judges of the Supreme Court, "is simply overwhelming to the human "mind. The inventor himself, broad-"browed as Plato or Webster, and with an "educated face, seemed astounded with "the greatness of his own invention; and "as he moves about the machine, fastening "a burr here and there, seems wrought up "with intense excitement—appears as (ut "a prophet or herald in the hands of the "Almighty, unconsciously assisting to "cradle some invention that shall change, "and possibly within five years, the whole "character of the human race and the "whole face of nature. As we saw that "the vapor or force was alone generated "by the breath, as we learned that the "only expense in running this new engine "was that alone incident to the wear and "tear of the machinery, we feel indeed as "if the destiny of the human race, the des-"tiny of the planet we inhabit, were al-"most fulfilled." If this is the effect of cold vapor," we think Mr. Keeley and his invention should receive the attention of the Excise Commissioners. He certainly should be required to take out a license before being allowed to dispense it. If Mr. Keeley's friends continue writing this kind of communication to the newspapers, we shall suspect that the mysterious multiplicator has a worm in it, and that the cold vapor product owes the government the customary tax per gallon.

New Publications.

THE USE OF STEEL FOR CONSTRUCTIVE PURPOSE. J. Barba, Naval Constructor at L'Orient (translated from the French), with a Preface by Alex. L. Holley, C. E. 110 pages. D. VanNostrand, 23 Murray street, New York.

Our readers are already familiar with a large part of the matter contained in this treatise, the greater portion of it having been printed in our columns in advance of its publication in the book form. The matter, like all that to which Mr. Holley's name is attached, is not only exceedingly interesting, but very valuable. A great many new and valuable facts are presented, which cannot fail to be useful to those interested in the manufacture and consumption of steel for engineering purposes.

HAND-BOOK FOR CHARCOAL BURNERS. By G. Svedelius. Translated from the Swedish by R. B. Anderson, A. M., Professor of Scandinavian Languages in the University of Wisconsin. Edited with notes by W. J. L. Nicodemus, A. M., C. E., Professor of Civil Engineering in the University of Wisconsin. 217 pages. John Wiley & Son, 15 Astor Place, New York.

This work is the indirect result of a prize offered by the Swedish government in 1862 for a popular treatise on the manufacture of charcoal and the preparation of peat. A committee of three were appointed to decide upon the papers. The prizes were not awarded till '67, when it was decided that no one was of sufficient value to deserve the prize, but an award was made to two of the authors, on condition that their productions were given to the committee to use as they deemed proper. These two papers were handed to Mr. Svedelius, who produced the present work, which was approved and duly published by the government in 1872. Availing himself not only of the two MSS. placed in his hands, the author had recourse to all other sources of information available, and has produced one of the most valuable treatises ever written on the subject of charcoal burning. The work is well illustrated. The paper and printing are unexceptionable. With such names as those of the translator and editor, it seems as though the book should have been well translated, and such it seems to have been in the main, yet we fail to see any possible excuse for leaving untranslated and practically undefined a foreign word which has practically perfectly intelligible and definite English forms of expression, either one of which would, with proper explanation, have accurately answered the purpose. A better and more accurate knowledge of technical English would enable translators in such cases to do much better work than at present, and prevent them from leaving the most significant word in the treatise untranslated from the beginning to the end.

The Centennial clock, which is being made at Plymouth, Conn., is to go to Independence Hall, Philadelphia, and one of similar pattern is to be made for the Centennial building.

Steel Manufacture.

We give below the address delivered by Mr. A. L. Holley, president, at the opening of the session of the American Institute of Mining Engineers. We regret that, owing to the pressure of matter upon our columns, we were not able to give it last week:

Iron and steel manufacturers are in a transition state. They cannot remain as they are, while to revolutionize them all at once would be to bankrupt them. We cannot afford to throw out all our old-fashioned iron machinery, nor to turn all our iron works into steel works, even in view of the steady substitution of steel for iron in structures and machinery. We must therefore feel our way into a larger economy and development—but how? Making little improvements here and there in bed plant, and empirically experimenting, are more or less useful, but the "survival of the fittest" is to be determined on larger issues than these. The improvements that are made must be sweeping and thorough. Those demanded in this critical situation of affairs are the following:

1st. *Cheap Power.*—The cost of coal to drive a Bessemer plant, with engines requiring five or six pounds of it per hour per horse-power, averages $1·50 per ton of ingots. Builders of improved engines will guarantee 2¾ to 3 pounds, and plenty of stationary and marine engines are running on this consumption. The saving of half the steam coal in a Bessemer works would pay for a quarter of the total labor on ingots, or for all the royalties. In some cases it would $50,000 per year. The average cost of power in a steel rail mill is about the same, and although mill engines are generally of better type, a large saving can also be made here. Occasionally such economics are made, as in the Troy Works, which by replacing a wasteful engine for a first-class one saved $25,000 per year. Blowing engines for plant furnace and Bessemer uses should be specially economical, but are specially wasteful by reason of slow piston speed. As steam expands in a cylinder after it is cut off, its temperature falls and it then cools the cylinder. Fresh steam admitted is condensed by the cold cylinder and is wasted. The faster the piston moves, the less the cylinder is cooled, and the less the waste. The reason often given for keeping unrefined steam engines is that they will stand the rough usage. But the inference that refined and economical engines will not wear as well and as long is wholly wrong. Compound and complex marine engines which rarely break down, stand the rougher stress of Atlantic storms. The Porter-Allen engine, one of the most refined and delicately adjusted of modern engines, has been proved to require less attention and repair than the average of old and wasteful ones. Durability is simply a question of good proportions, materials and workmanship. Tinkering with old and poor engines only prolongs the wasteful life of a radically bad system. The best way is to make a sweeping change, which can be well afforded in view of the enormous losses mentioned.

2d. *Improved Heating Furnaces.*—Ordinarily coal furnaces cannot be run with economy, however carefully attended. They waste fuel, and as the flame is always more or less oxidizing, they waste the metal heated much more. Do iron makers realize this loss? In a rail mill making 40,000 tons a year, and reheating the stock, the usual waste of eight per cent. by oxidation is above $200,000 per year. But the regenerative gas furnace, now highly perfected, although but slowly coming into use, in our old works, saves (averaging a number of cases) 2·8 per cent. of this waste over the coal furnace. Its economy in oxidation has been as high as 3·33 per cent. in one case and 4·45 in another. The smaller of these economies would amount to $70,000 per year in the rail mill mentioned. Beside this the gas furnace saves 5 to 25 per cent. of fuel, depending on circumstances. Its waste heat is utilized in heating the air and gas for combustion, consequently, it cannot furnish heat for steam, as the old coal furnace does. The gas furnace has many other advantages. Its most imperfect feature is the gas producer, but this is being improved in various ways. There are other improved furnaces approaching the gas furnace in economy and adaption, except for very high heats. That of Mr. Sweet, of Syracuse, N. Y., and that of Mr. Price, of England, about which Mr. Lowthian Bell recently read a paper, are among the most conspicuous. Price's furnace effects a considerable economy of fuel and oxidation, and is partially regenerative, although it uses solid fuel. It may be applied in old works with comparative cheapness, while the Siemens' gas furnace requires very radical changes in plant.

3d. *Refractory Materials.*—Better fire resisting linings for metallurgical furnaces and vessels is the great want, and this want is more pressing as processes and products become more refined. In the Bessemer processes they cost $1 per ton of ingots, and in the Siemens-Martain process, not far from $5, while several new and important processes cannot be carried out at all commercially without better refractories than we have. The problem is a difficult one, and has been much better solved abroad than here, because more scientific work has been brought to bear upon it. The small variations of silica rock and fire clay (the principal materials employed) in fluxing ingredients, bewilder and discourage empirical experiments. As individual works will not and should not make the expensive chemical and crucical tests required, which will be for the general benefit, a commission at the expense of all the works should immediately be made, to promote the preparation of better refractory mixtures. Such commissions have done much good and settled difficult questions before, and this case seems to especially call for such assistance. As natural materials are so variable, probably pure materials should be prepared for experimental purposes, to determine just what we want. It is also probable that mixtures can be made artificially more uniform than they can be found in nature, such as the excellent and rare refractory bauxite, which is chiefly oxide of iron and alumina. But there are refractory earths other than silica and fire clay. Alumina, magnesia and lime are absolutely unchanged by mere heat, and this is also true of carbon. These materials are also more or less unchanged by chemical action of the metallic oxides heated in them. Much has been done in this direction in making crucibles abroad, and there is a good prospect that these substances may be successfully used in larger metallurgical vessels. The great difficulty is to make them adhere in solid masses without binding them with ingredients that will flux and destroy them. The cooling of refractory linings by water jackets and pipes to keep down their heat and wear, is successfully done in some cases, and ought to be much more largely applied. It should be one of the chief means of improvement.

4th. *Enlarging the Range of Manufacture and Utilizing Waste Products.*—The growing adaptation of the soft steels to structural purposes in foreign countries, should be more largely considered. In France, three men-of-war, built of steel, were so successful that three more ships have been ordered. Steel government ships are building in England. All the locomotives on the London and Northwestern Railway, and many on other railways, are built almost wholly of steel. Ordnance, both large and small, is largely fabricated of steel, and Krupp is making 14-inch guns of this material. One Bessemer works in England has made 10,000 tons of boiler plate, and one machine works has made 700 steel boilers; and everywhere, already, steel is more and more largely employed in structures, machinery and arts. In this country, however, out of a Bessemer product of 350,000 tons per year, we are putting scarcely 6000 tons into other uses than rails, with every facility for doing what is done abroad, and with a growing desire on the part of our engineers to get the better material, our steel manufacturers are devoting more concentrated effort to preventing the over-production of their one specialty, rails, than to enlarging the range of their products. It is, therefore, essential that they should, 1st, practice making the various constructive steels, so as to learn all about the necessary raw material and treatment, and thus get confidence in their own abilities; 2d, they should increase their facilities—hammers, roll trains, etc., to produce the new shapes required. This can be economically worked into by gradual changes in existing machinery. Engineers and builders will not largely buy steel until facilities for making it are well developed; 3d, they should take initiative in the new art developed already, of heating, shaping and working steel into construction. The old iron processes are not suitable to steel, but the new art may be readily acquired and economically practiced. The advantages of steel cannot be monopolized by present steel makers. Iron works can gradually introduce the steel manufacturing by means of the Siemens-Martin process. A very important aid which iron and steel makers can render to themselves and to the public is to furnish specimens, and in every way facilitate the labors of the United States Board, appointed to test iron, steel and other metals. The works of this board will be thorough in a degree never attempted before.

In conclusion, although these criticisms are just, and should be seriously considered, it would be ungracious not to mention the success of the American iron and steel works in turning out larger products than given plants do abroad, and in largely stopping foreign importations, both by reason of the price and quality of the American product.

Arrangements for the Centennial.

INTERNATIONAL EXHIBITION, 1876.
UNITED STATES CENTENNIAL COMMISSION,
PHILADELPHIA, Nov. 3d, 1875.

To the Editor of The Iron Age.—The enquiries which reach this office show so insufficient an understanding of the International Exhibition that I have had prepared statements of some important items which it is desirable to make known.

I trust they will impress you as interesting to your readers, and that you will publish them for the general information of the public.

Very respectfully, yours,
A. T. GOSHORN, Director General.

Accompanying this letter is the following, which will be found of interest to our readers:

The Act of Congress which provided for "celebrating the one hundreth Anniversary of American Independence, by holding an International Exhibition of Arts, Manufactures, and Products of the Soil and Mine," authorized the creation of the United States Centennial Commission, and entrusted to it the management of the Exhibition. This body is composed of two Commissioners from each State and Territory, nominated by the respective governors, and commissioned by the President of the United States. The enterprise, therefore, is distinctly a national one, and not, as has sometimes been stated, the work of a private corporation.

The exhibition will be opened on May 10th, 1876, and remain open every day, except Sunday, until November 10th. There will be a fixed price of 50 cents for admission to all the buildings and grounds.

The Centennial grounds are situated on the western bank of the Schuylkill River, and within Fairmount Park, the largest public park in proximity to a great city in the world, and one of the most beautiful in the country. The park contains 3160 acres, 450 of which have been enclosed for the Exhibition. Beside this tract, there will be large yards near by for the exhibition of stock, and a farm of 42 acres has already been suitably planted for the test of plows, mowers, reapers, and other agricultural machinery.

The exhibition buildings are approached by eight lines of street cars, which connect with all the other lines in the city, and by the Pennsylvania and Reading railroads, over the tracks of which trains will also run from the North Pennsylvania and Philadelphia, Wilmington, and Baltimore railroads. Thus the Exhibition is in immediate connection with the entire railroad system of the country, and any one within 90 miles of Philadelphia can visit it at no greater cost than that of carriage hire at the Paris or Vienna Exhibition.

The articles to be exhibited have been classified in seven departments, which, for the most part, will be located in appropriate buildings, whose several areas are as follows:

Department.	Buildings:	Acres Covered.
1. Mining and Metallurgy	Main Building	21·47
2. Manufactures		
3. Education and Science		
4. Art	Art Gallery	1·5
5. Machinery	Machinery Building	14·
6. Agriculture	Agricultural Build'g.	10·
7. Horticulture	Horticultural Build'g	1·5
Total		48·47

This provides nearly ten more acres for exhibiting space than there were at Vienna, the largest International Exhibition yet held. Yet the applications of exhibitors have been so numerous as to exhaust the space, and many important classes of objects must be provided for in special buildings.

An important special exhibition will be made by the United States government, and is being prepared under the supervision of a Board of Officers representing the several executive departments of the government. A fine building of 4½ acres is provided for the purpose, space in which will be occupied by the War, Treasury, Navy, Interior, Post Office and Agricultural Departments and the Smithsonian Institution.

The Women's Centennial Executive Committee have raised $30,000 for the erection of a pavilion in which to exhibit every kind of women's work. To this collection, women of all nations are expected to contribute.

The list of special buildings is constantly increasing, and present indications are that their total number will be from 200 to 250. Most of the important foreign nations—England, Germany, Austria, France, Sweden, Egypt, Japan, and others—are putting up one or more structures each, for exhibiting purposes, or for the use of the commissioners, exhibitors and visitors. Offices and headquarters of this kind, usually of considerable architectural beauty, are provided by the States of Pennsylvania, Ohio, Indiana, Illinois, Michigan, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, Missouri, Kansas, Virginia, West Virginia, Nevada, Wisconsin, Iowa and Delaware; and it is likely that others will follow the example.

A number of Trade and Industrial Associations, which require large amounts of space, will be provided for in special buildings. Among these are the photographers, the carriage builders, the glass makers, the cracker bakers, the boot and shoe manufacturers, beside, quite a number of individual exhibitors. The great demands for space will probably render this course necessary to a considerable extent, especially for exhibitors who have been tardy in making their applications. In the Main Exhibition Building, for example, 333,300 square feet of space had been applied for by the beginning of October by American exhibitors only; whereas, the aggregate space which it has been possible to reserve for the United States Department, is only 160,000 square feet, about one-third of which will be consumed by passage ways.

The Machinery Building, like the others, is already fully covered by applications. There are about 1000 American exhibitors in this department, 150 English and 150 from other European countries—which is about 250 more than entered the Vienna Machinery Exhibition. Extra provision is being made for annexes to accommodate the hydraulic machinery, the steam hammers, forges, hoisting engines, boilers, plumbers, carpenters, etc.

Power in the Machinery Hall will be chiefly supplied by a pair of monster Corliss engines. Each cylinder is 40 inches in diameter, with a stroke of ten feet; the fly-wheel is 31 feet in diameter, and weighs 55 tons; the horse-power is 1400; and the number of boilers is 20. This engine drives about a mile of shafting.

For the Art Exhibition, the most eminent American artists are understood to be at work, and it may be confidently stated that, especially in the department of landscape painting, the United States will present a finer display than the public has been led to expect. Quite aside from the contributions of American artists, applications from abroad call for more than four times the exhibiting space afforded by the great Memorial Hall. Provision for the surplus will be made in temporary fire proof buildings, though all exhibiting nations will be represented in the central Art Gallery.

The Secretary of the Navy has arranged that a United States war vessel shall call next spring, at convenient European ports, to collect and transport hither to the Exhibition the works of American artists resident in Europe. Among the ports thus far designated, are Southampton for England, Havre for France, Bremen for Germany, and Leghorn for Italy, to which, if desirable, others may be added.

Mr. Bell, the eminent English Sculptor, who designed the groups for the plinth for the great Albert Memorial in Hyde Park, London, is reproducing in terra cotta, at the celebrated works in Lambeth, the one which symbolizes America. The figures in this group are colossal, covering a ground space of 15 feet square. It will probably be placed in the great central gallery, opposite the principal entrance.

The Art Exhibition will include, in addition to the works of contemporary artists, representative productions of the past century of American art—those, for instance, of Stuart, Copley, Trumbull, West, Alston, Sully, Neagle, Elliot, Kensett, Cole. These, as well as the works offered by living artists, will be passed upon by the Committee of Selection, who will visit for the purpose, New York Boston, Chicago, and other leading cities, in order to prevent the needless transportation to Philadelphia of works of art not up to the standard of admission.

A large number of orders and fraternities have signified their intention to hold gatherings at Philadelphia during the period of the Exhibition. Among those which may now be enumerated, are the Grand Lodge of Pennsylvania, Independent Order of Odd Fellows; the Grand Encampment, Independent Order of Odd Fellows; Grand Lodge, United States, Independent Order of Odd Fellows; Grand Commandery Knights Templar; Grand Army of the Republic; Presbyterian Synod; Caledonian Club; Portland Mechanic Blues; Welsh National Eisteddfodd, Patriotic Order Sons of America; California Zouaves of San Francisco; an International Regatta; the Life Insurance Companies; National Board of Underwriters; State Agricultural Society; 2nd Infantry, N. G. of California; Philadelphia Conference, Methodist Episcopal Church; Cincinnati Society; California Pioneer Society; American Dental Convention; Catholic Total Abstinence Union of America; Independent Order of B'nai Berith; National Alumni Association; Salesmen's Association; 5th Maryland Regiment; Amearican Pomological Society; Malster's Association of the United States; Army of the Cumberland; Humboldt Monument Association; Christopher Columbus Monument Association; Board of Trade Convention; International Typographical Congress; Rifle Association of the United States; Centennial Legion; Philadelphia County Medical Society; International Medical Congress; Old Volunteer Fire Department of Philadelphia.

The Inventor of the Steam Blast Pipe.—Mr. T. Hackworth, in a letter to the London *Mining Journal* says: "The Railway Jubilee at Darlington having lately been the theme of all the leading papers, has caused the wide circulation of the false notion that George Stephenson invented the steam blast pipe. In a work entitled "The Gentle Life," is an essay on "Success in Life," which contains the following remarkable words: "Stephenson borrowed and purloined his ideas." This I am prepared to prove with reference to the blast pipe. The Royal George, built by Timothy Hackworth, in 1827, was the first engine to which the steam blast was ever applied (see *Practical Mechanics' Journal*, 1850 and 1851; and *London Quarterly Review*, January, 1858. In a letter dated July 25, 1828, written by George Stephenson to Timothy Hackworth, speaking of his new engine, the Lancashire Witch, he says: "We have tried the new locomotive engine at Bolton, we have also tried the blast to it for burning coke, and I believe it will answer. There are two bellows worked by two eccentrics underneath the tender." Yet Mr. Smiles would have the world believe that Stephenson used the steam blast in 1817, whereas we find that in 1823 he really knew nothing at all about it. Now, as to the "purloining." On the day previous to the famous Rainhill trial the engines were privately tested. Stephenson's Rocket could not generate her steam sufficiently fast, while Hackworth's Sanspareil was always in full steam. "How is't," said Stephenson, "that your engine keeps up her steam?" "Oh," replied Hackworth. "I have a little chap inside who manages that"—alluding to the blast pipe. That night Stephenson secretly sent men to ascertain the make and shape of the wonderful invention, and next morning the Rocket was found fitted with a blast pipe. This reminds me of another noteworthy fact with reference to the trial at Rainhill. Timothy Hackworth, being at that time engineer and manager of the Stockton and Darlington Railway, had to entrust to others the making of the various parts of his engine—the Sanspareil. The cylinder which burst was cast by Stephenson; the metal where the fracture took place was less than 1-16th inch in thickness. In the name of justice I ask you to publish these facts, which are well known to all engineers acquainted with the early history of steam locomotion."

The Iron Stores of Nijninovgorod.—On the occasion of the Duke of Edinburgh visiting these stores great efforts were made to give him a suitable entertainment, and also at the same time a significant demonstration of what importance their iron trade had arrived at. The following is the description of the entertainment as given in the *Times:* "The iron stores are situated on a sandy island in the middle of the river Oka, three-quarters of a mile long, which is not only covered with water at certain seasons, but changes its shape every year. The quantity of iron collected here in bar and sheet amounts to 90,000 tons, valued at £2,000,000. In quality it is said to be better than the Lowmoor and equal to the best Swedish. Little of it, however, finds its way to England. A tramway runs the whole length of the island, but still it is difficult to believe that not only are the whole of these enormous stores filled and emptied in six weeks, but that the storehouses themselves are removed, and that their sites are covered in spring by 10 or 12 feet of water. The pavilion in which luncheon was served was constructed entirely of the material constituting the stock-in trade of those who gave the entertainment, and in shape resembled a turreted mansion. The turrets were built up of bar iron (the bars being laid crosswise over each other, with the ends projecting), and surmounted by battlements, which were represented by iron buckets. The body of the castle was of sheet iron, while iron buckets and baskets turned over made extremly pretty ornaments round the arches of the doors and windows. The whole of this had been built in three days and nights. It enclosed a room 100 feet long by 50 wide, tastefully hung with striped stuffs and decorated with flags."

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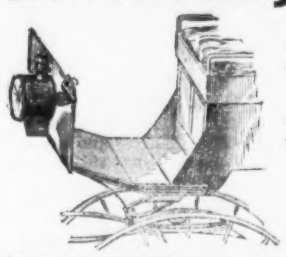

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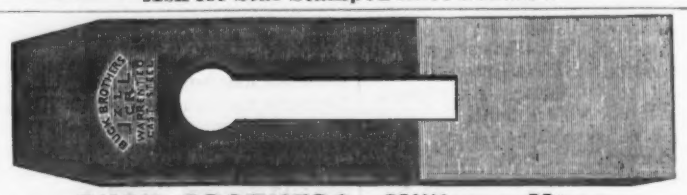

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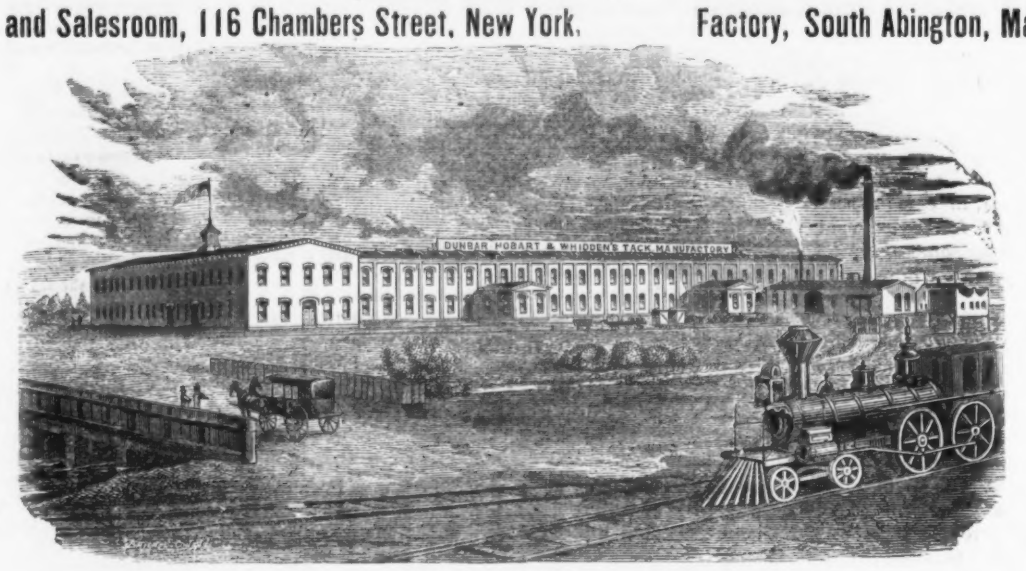

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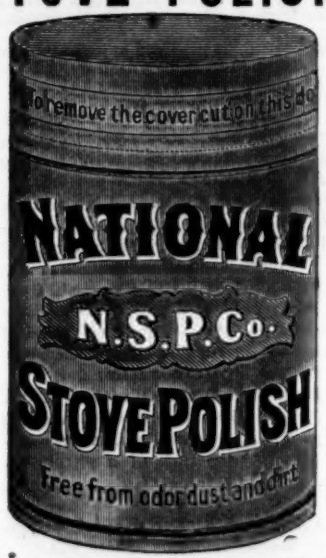

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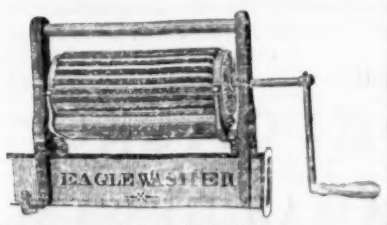

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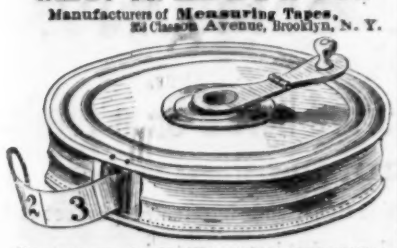

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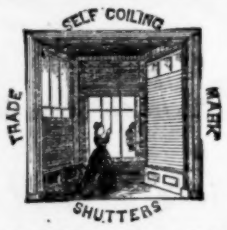

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House's Patent Combination Spring Hinges.

The object of this hinge is to swing the door in both directions through the casing. Fig. 1 shows the hinge as it appears when looking at the edge of the door from the back, the hinge being closed. At the side of this cut is a diagram of the springs used in the hinge. This hinge forms a solid joint alike on both sides of the door, and when the door is open a solid joint is formed in the center, as shown in Fig. 2. The springs are spiral and flat torsional combined,

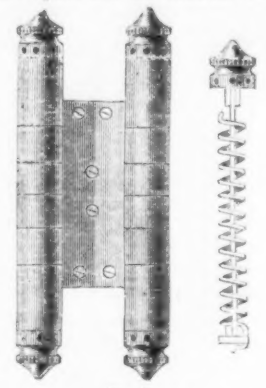


Fig. 1.

and are so wound up that the door is always closed, no matter in what direction it may have been swung. It acts precisely in this respect as two of the ordinary spring hinges do when connected to a door and casing by the usual strip of wood, but it is claimed to have several advantages over this method. Among the advantages claimed are a freedom from sagging, an ability to hold up heavy doors, compactness and neatness. The door is, of course, left entire, not being divided at the back edges for the attachment of one set of springs. The springs are so arranged that the hinge may be made to carry doors of almost any required weight. These springs are fastened upon the door or

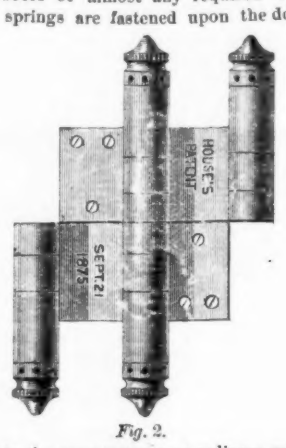


Fig. 2.

casing in the same manner as ordinary springs. The hinge is made in all the usual sizes, and also with extra flanges to fit doors which must swing clear of extra wide casings.

Messrs. House Brothers, 194 Broadway, New York, are the patentees and manufacturers. Though the hinge is quite simple and its action easily understood on inspection, it is by no means an easy matter to describe the manner in which the inventor has succeeded in combining hinges opening in both directions. The object has been accomplished, however, and the hinge seem to be capable of doing very satisfactory work.

Great Guns—The Old and New.

The New York *Post* has the following pleasant gossip in relation to great guns of ancient and modern times :

The contest between guns and armor continues to excite the liveliest interest among European nations. The great arsenals are vieing with each other in the production of mighty cannon, which shall be able to send a projectile weighing many hundreds of pounds through iron obstacles of almost incredible thickness, or of iron targets which shall be able to resist the heaviest bolts that can be forged.

The English are now rejoicing over the successful trial of the new 80-ton gun, which can throw a projectile 16 inches in diameter a distance of seven or eight miles, and pierce the sides of the strongest man-of-war afloat at a closer range. Next we shall probably hear of the construction of some unwieldy floating battery specially designed to carry armor capable of resisting the tremendous impetus of a shot from this latest engine of war; and then the forges will glow with mountains of incandescent metal, until a gun of still greater dimensions and power is produced. As there appears to be no limit to the size of cannon, it seems probable that the victory in the struggle between guns and armor will finally declare itself in favor of the former, or that it will, at all events, be necessary to construct vessels of the monitor type only, which present the smallest possible target to the fire of the enemy. This is a question, however, which must be left to the Armstrongs and Whitworths of the future to answer.

In the meantime it is interesting to remember that the monster cannon now in existence are simply examples of the manner in which history repeats itself. Four centuries ago, in 1478, the Turks erected a battery of guns against Scutari, the largest of which was capable of throwing a stone shot 32 inches in diameter, and weighing 1640 pounds, whereas the projectile of the English 80-ton gun weighs only 1250 pounds. It is evident, moreover, that these enormous guns were of practical service, for it is recorded that 2534 rounds were fired from them in 30 days. At the castle of Asia, on the Dardanelles, there still exists a battery of bronze cannons, some of which have a bore 28 inches in diameter. When the British Admiral, Sir John Duckworth, forced the passage of the Straits, in March, 1807, one of his ships was struck by a huge stone bullet thrown from one of these guns, and it is said that the missile made so large a hole in the side of the vessel that the captain, when he looked over the side to see the extent of the injury, was surprised to see two of his sailors thrust their heads through the aperture at the same instant. The Royal George, whose name is familiar to every reader of Cowper's poetry, was one of the ships injured in this encounter. The great gun of Beejapore, with a caliber of 28 inches, is another instance of what gun founders could accomplish more than three centuries ago. This weapon was last discharged, it is said, during the eighteenth century, on the occasion of a visit from the Rajah of Sattara. The shot weighed more than a thousand pounds. The Tzar Pooshkar, or great gun of Moscow, has a bore of 35 inches in diameter, but has never been fired with shotted charges, and we think that few persons would be anxious to make the experiment now. There are many other great guns famous in history, but those we have mentioned are sufficient to prove that in the matter of capacity, at least, the guns of the present are no more remarkable than the guns of the past.

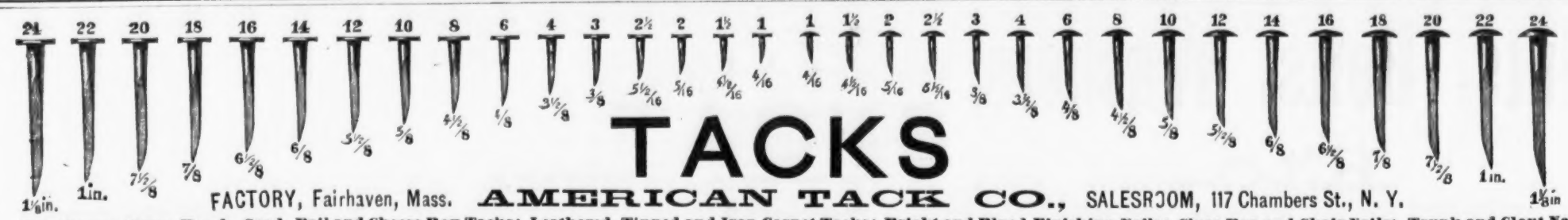
An Immense Dry Dock at Kensington, Pa.

The Philadelphia *Ledger* says: Messrs. William Cramp & Sons, the iron ship builders, are engaged in an enterprise of great importance to the business and commercial interests of Philadelphia, in the construction of an immense dry dock at their yard at the foot of Palmer street, Kensington. The property is their old or "lower" ship yard, and has a frontage on the river of 230 feet, and a depth of 619 feet from Beach street to the Port Warden's line. It has also the important adjuncts of a brick machine shop, a blacksmith shop and a large marine railway capable of taking out vessels of 1000 tons, all of which will remain on the property. The materials and workmanship of the great dock will all be of the best quality, and the intention is to make it a first-class construction in every respect. The basin will be 563 feet long and 111 feet wide and 25 feet deep, and over 4000 piles will be driven to form the bed and sides; two rows of sheet piling of tongued and grooved white oak plank will also be driven around the entire basin to render it completely water-tight. The pumping capacity will be double that of any other dock in the United States; it will be supplied with four centrifugal pumps, each capable of lifting 30,000,000 gallons per minute, and of emptying the entire huge basin in three-quarters of an hour. An idea of the great proportions of this pumping machinery may be gained from the fact that it will require a culvert 7½ feet deep by 15 feet wide to discharge the water from the pumps. The dock will be large enough to accommodate a steamer 100 feet longer than the ships of the American Steamship Company. The cost of the improvement, including the value of the land, will be about $400,000, and it is expected that the work will be completed by the first of March next.

An idea of the manner of working the dry dock may be of interest. The bottom of the basin has along the center a row of large stationary blocks at intervals of ten or 15 feet. On top of each of these blocks are laid two immense wedges one on top of the other, their points turned in opposite directions, so that by moving them inwardly the surface is raised, or outwardly it is lowered. These wedges are connected by chains and falls with the banks of the dock, so that they may be moved while under water. Across the bottom of the dock, from side to side, are laid iron tracks, on which run large timber "cradles" or blocks, made to fit the shape of a ship's hull. These also have chains running to the bank, so that they may be drawn up against the ship's side while the dock is full of water.

The end of the dock is provided with immense flood-gates, arranged to be opened and closed. When a ship is to be docked, the basin is filled with water and the ship floated in. The row of wedge blocks is then adjusted along under the keel by means of the chains spoken of above, and then made to fit snugly against the keel for its entire length. The "cradles which run on the bottom of the dock are then drawn up also by means of chains tightly against the bottom and sides of the ship. The flood-gates at the end of the dock are closed, the pumps set in motion, and in less than an hour the basin is clear of water, and the ship is seen high and dry on the blocks, resting on the bottom of the basin, with her hull completely exposed for examination or repairs.

The *Coal Trade Circular* says: "One breaker destroyed and two others set on fire within three days proves that the outlaws of the coal regions have only stopped killing to destroy property and deprive people of the means of earning their daily bread. And these men call themselves the friends of the workingmen, and there are some workingmen who are their apologists. Had the William Penn breaker been destroyed, over three hundred men and boys (upon whom over a thousand women and children are dependant for support) would have been thrown out of employment, just as we are entering on what promises to be a very hard and trying winter. Each day's developments only goes to show that if there is to be security for life and property here, the people must take matters in their own hands, and, in the course of a popular uprising, make such examples as will convince the scoundrels that their day is over and it is now time for them to move. Arson may now be added to murder on the bill of indictment on which the people will soon be called upon to act.



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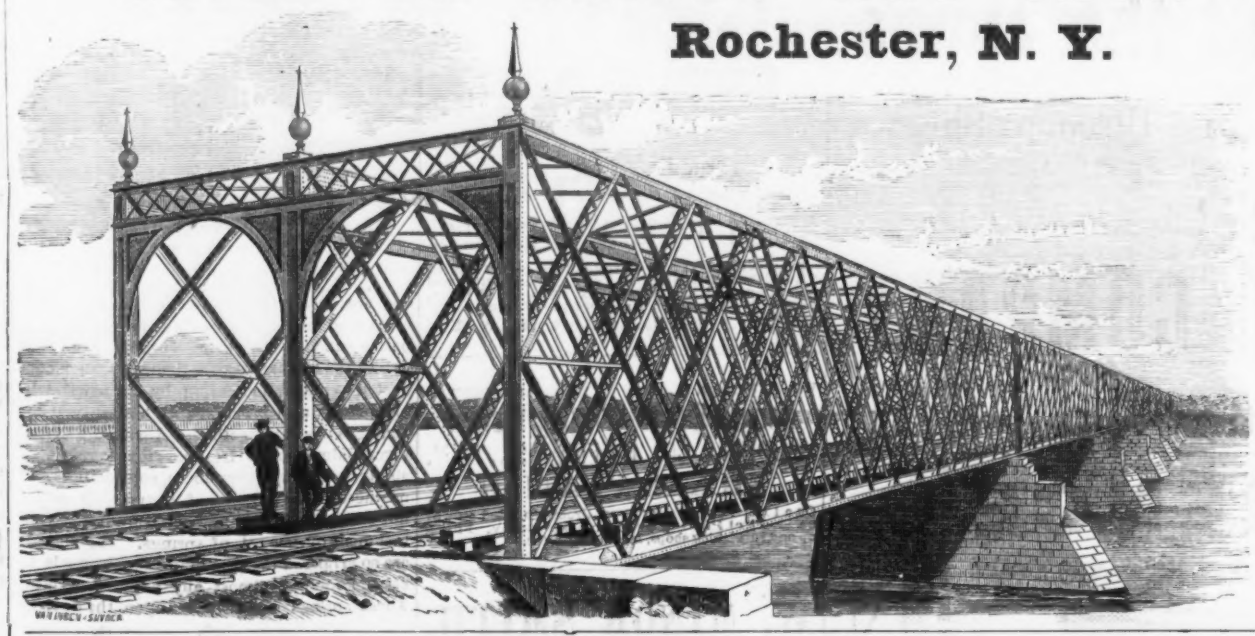

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[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

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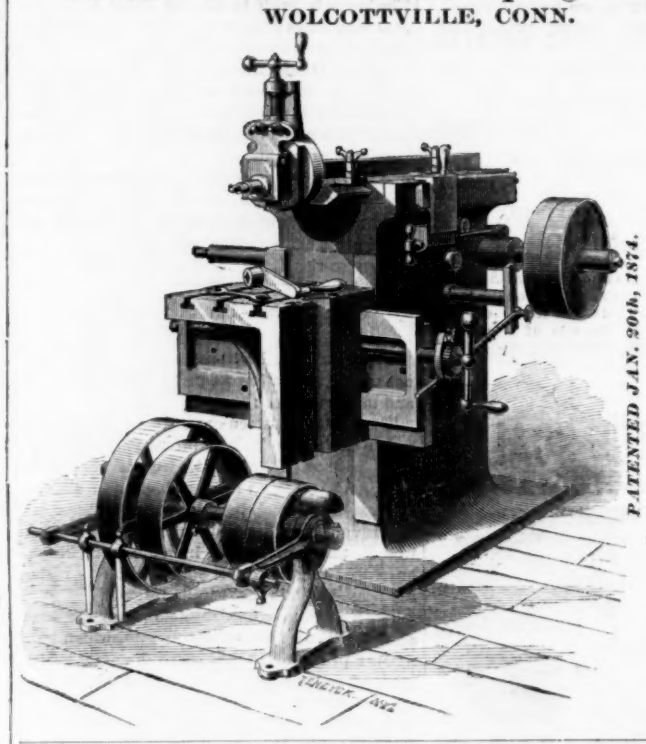

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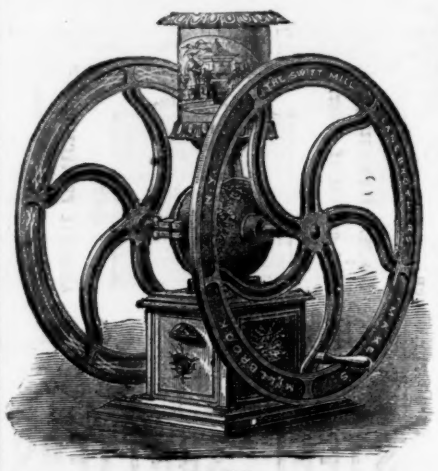
Of Superior Quality made to order.



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The Manufacture of Stained Glass in England.

In an article in *Iron*, on the industries of Birmingham, we find the following:

When a stained glass window is required the first thing to be done is to forward to the maker an accurate plan of the shape and size of the window and the subject which it is desired to represent. A design in colors is then made, and submitted for approval. When this has been done, a copy is drawn of the full size of the window. This drawing is made structurally, and on the flat, and with but little shading. This method of drawing is necessary, as each piece of glass has to be fastened in leads, and the work is, of course, mosaic, all the effects of color being produced by the glass itself, and those of distance, drapery and so on, by the painting. All the drawings are colored by Mr. John Powell, who performs this most important and artistic part of the work himself.

The working drawing finished, we turn next to the glass. It is produced in small muffs, and is of irregular thickness, which produces tints of a deeper and lighter shade. The muffs are opened and the glass flattened, still preserving the irregularity of texture. In all colors, with the exception of ruby—which is "flashed"—the glass is what is termed "pot metal," and is of one color throughout. It is then cut into the required size or patterns by diamonds, the edges being trimmed with pincers.

The pieces of glass are then laid on the cartoon, or drawing, and the skillful workman proceeds to paint them. This is done by lines, and in such a manner as to produce the effects of light and shade. There is no enameling of any kind. The lines laid on by the painter only produce the effects of light and shade, of distance, the folds of the drapery on the figures, and so on, but all the tints from the brightest crimson to the deepest red, from the brightest blue to the darkest of blue tints, are in the glass itself, and are not laid on at all. White glass is stained yellow by using chloride of silver, and the most exquisitely beautiful work is thus produced, embodying the nicest gradations, passing from deep brown to pale yellow, delicate in execution, artistic in design, harmonious in color and lovely and delightful to the eye. The material used in general painting is oxide of iron and flux.

When painted the glass has to be burnt. The pieces are laid on iron plates, lightly covered with sand. The sand is merely to prevent the glass from setting on the plates. The plates are then placed in rows, one above another, in a cast iron muffle. This muffle is closed by an iron door, a quantity of fire-clay is placed before it, and then the whole is closed by another iron door, and heated air passed round the muffle. By this heat the glass is softened, the flux used in painting is liquefied, and thus attaches itself to the glass. It takes from five to six hours to heat, and from twelve to fifteen to cool the glass afterward. The cooling is done gradually, and when finished the painting is as hard as the glass itself. Sometimes the glass has to be burnt twice or thrice in the process of making.

The next operation is called "leading up." This is very important. The cartoon is fixed on a bench or board, and a straight edge of wood is placed on the side nearest the workman. Against this is laid a straight piece of lead, in which is a groove for the glass to be fixed in. All the pieces of glass, no matter how numerous, no matter what their shape or form, are fixed into pieces of lead thus grooved. The lead is bent round the pieces of glass, and is then cut off, and each of these joints is afterward soldered. The pieces of glass, during the operation, when placed in the lead, are kept in their proper position in the window by the means of iron pins. Windows are thus made in lengths for the convenience of packing. The lead "carms" used for fixing the glass are cast on the premises.

After "leading up," the pieces in the window have to be fastened at the joints by soldering. For this purpose it is placed on a table, and soldered in the ordinary manner at each joint; it is then turned over, and is soldered on the other side.

Another operation has yet to be performed. We mentioned above, that in order to produce different shades in the coloring of the glass, it was made of irregular thickness. In consequence of this difference in its thickness some parts of the glass do not fill up the grooves of the lead in which is fixed, and others make it bulge a little. If left thus the window would let in the rain, or rattle in a wind. To make it safe and sound a cement composed of red lead and whiting—in fact, putty in a nearly liquid state—is spread over the whole surface with a brush. By a peculiar motion of the workman's hand this is forced into all the interstices, and the rest rubbed off. This is done, of course, on both sides of the window, and this in a little time becomes so hard that it is easier to break the glass than to take the window to pieces. When this is done, the window is finished and ready to be sent to its destination.

In looking at such a window, we at once see why it is that the lines of lead in no way interfere with its beauty. At the proper distance these are not seen at all, and the subject represented is altogether complete and unbroken. Nay, their presence adds to the beauty of the whole, instead of detracing from it. If it were not for these dark lines of intersection, the varied bright tints of the glass coming so closely together would appear blurred and indistinct at the lines of junction, but as it is they blend gradually and harmoniously together.

An application has been made to the Philadelphia Councils to allow steam cars to be employed on the city railways next year; and a resolution has been offered to permit the Baldwin Locomotive Works to make a trial of a steam car.

BUSINESS ITEMS.

WESTERN STATES.

The work of replacing two of the Bessemer plants in the Cleveland Rolling Mill Company's works, with Siemen's plants is progressing slowly. The rail mill of the Cleveland Rolling Mill Company is running on rails for the Wabash Road. The company are running double turn in every department, excepting the plate mill.

The Emma Furnace is making from 40 to 60 tons of metal per day, the bulk of which is worked up by the Union Works. This furnace has made a history for itself, in one respect that, we believe, has never or since been equalled. The furnace was banked upon the fourth day of December, and blown in on the ninth day of July last, a period of 205 days, during which time no blasts were made, and she was in no way disturbed, and the fires were in good condition.

The dimensions of the new blast furnace of the Iron and Steel Company, of Ironton, O., are 58x16 feet. Only ⅓ Missouri ore is now being used in the furnace, and the production is 40 tons of iron per day. Steam is generated in their rolling mill by gas from their new blast furnace.

The Cuyahoga Falls (Ohio) Wire Works are running to their full capacity, night and day.

The Wrought Iron Bridge Co., of Canton Ohio, have been awarded the contract for building the Green Lawn Avenue Bridge, at Columbus, Ohio. The bridge is to be of wrought iron in every detail, and consists of two 154 ft. deck truss spans, 124 ft. deck truss span, and 64 ft. through truss span, all built on the improved plate and channel truss plan, patented by this company. This company have also received the contract for a bridge at Tonawanda, N. Y., consisting of three 100 ft. deck truss spans, on their plate and channel truss plan, with all wrought iron details. They have recently completed a railway bridge at East Saginaw, Mich., consisting of 157 ft. fixed truss span, and 196 ft. swing truss span, all placed on concrete filled, wrought iron piers, placed on pile and timber foundations, and have now on their order books over 12,000 ft. of iron bridge work designed for different points amounting to over $400,000.

The North Chicago Rolling Mill Company expects to make fully 8000 tons of iron and steel rails this month.

The *Iron Home* says: After a long and tedious siege the Michigan Iron Company has gone into bankruptcy. The assignee will have an army contract on his hands for settlement with the creditors, and it is to be hoped that there will be some kind of a dividend made before another year. The company has a large amount of property. What it will bring at forced sale is hard to tell.

The Ironton (O.) *Journal* says: Belfont furnace has gone out of blast for a few weeks, for the purpose of working up stock at the mill.

The Union Steel Screw Works, of Cleveland, Ohio, is organized under a charter with an authorized capital stock of one million dollars. They control the patent for the manufacture of screws from Bessemer steel, and the works are, we believe, with one exception, the largest in the country, and the only works, except those of the American Screw Company, that manufacture all the sizes on the list. The building capacity of the works is equal to the production of ten thousand gross of screws, of all merchantable sizes, per day. The whole work of screw making, proper, is done by machinery, and so perfectly is the mechanism adjusted to the requirements that human agency bears but a small fraction of labor and responsibility, one young girl being able to attend to as many as twenty-seven of the intricate machines. After the wire is straightened and cut to the proper lengths it passes through an automatically fed "shaver and nicher," which turns down the head and cuts the niche. These machines complete their portion of the work at the rate of twelve blanks per minute. The screw is then passed to the "threaders," which turn the point and cut the thread, at the rate of fifteen gross per day. A large number of these machines are used. The machines are necessarily somewhat complex, as may be inferred from the fact that the company have from twenty to thirty thousand patterns, which represent the different parts. The company make the boxes in which their screws are packed. They have a number of box machines each of which turns out an average of ten thousand boxes per day.

There is being made at the Globe Iron Works, Cleveland, O., for the Cleveland Rolling Mill Company, a 24x30 engine for the company's Saginaw mining lands.

The National Tube Cleaning Works, Cleveland, O., make over 70 sizes of tube cleaners, varying from 1 to 18 inches.

McDonald & Co., manufacturers of agricultural implements, at Wooster, O., made an assignment recently. Liabilities, $300,000.

The nail mill at Belleville, Ill., made 88,500 kegs of nails last year.

A school of mines has been inaugurated in connection with the Michigan University. It has assay furnaces for gold, silver and other metals, forges, blast furnaces and all possible appliances for practical work in metallurgy.

On the 4th ult. seventeen car loads of ready fitted material for Pullman palace cars, to be put together in England, were shipped from the works of the company at Detroit.

Another new iron boat has been completed and put in service at St. Louis. That city is indebted to the general government for inaugurating the era of building iron boats on the Mississippi River, and, already, according to experienced steamboatmen, the era of wooden steamers on the Mississippi River is ended.

A galvanized door cap seven and one half feet high and nine and one-half feet wide was sent to Attica, from Indianapolis, a few days since, to be used on a new hotel at that place.

The King Iron Bridge Company, Indianapolis, have recently constructed one of their bridges of four spans of 150 feet each to be erected at Corning, N. Y., another of five spans of 120 feet each for Cedar Rapids, Mich., also a single span 200 feet long for Black River, N. Y.

The Novelty Iron Works, Cleveland, O., have just completed the iron work for the new jail at Coldwater, Mich. They have three iron roofs and twelve bridges, one of them of 312 feet span, for the Kanawha River, in course of construction, and are running to their full capacity.

The Joliet, Ill., Iron and Steel Works, the other day, turned out in a day's turn 404 rails, and the night turn of eleven hours and twenty minutes made 405 rails, weighing 60 lbs. per yard, and aggregating 216 tons, and making 2 1-5 miles of track.

The new zinc rolling mills, at La Salle, Ill., are completed and in full operation.

The file works of E. J. Parkin, Cleveland, O., are running full time, and trade is increasing largely.

The L. L. Crane Manufacturing Works, Cleveland, O., which were bought in on foreclosure by Lord, Bowler & Co., are held for sale in whole or in part.

The Lake Erie Iron Co, Cleveland, Ohio, propose keeping their works going with a reduced force, to do which they are receiving sufficient orders.

The Menominee (Mich.) Furnace is making about 150 tons per week. Part of the fuel used is pine charcoal. Two new kilns are in course of construction.

Both the Indianapolis and the Capital City rolling mills, Indianapolis, Ind., are running full time and full handed, and have orders sufficient to keep them busy for several weeks to come.

The Northwestern Gas and Water Pipe Co., of Bay City, Mich., has failed. Liabilities, $130,000; assets not stated. Bailey & Orton, hardware dealers in the same place, have also closed.

The Kansas Manufacturing Company, Leavenworth, Kansas, make all kinds of farm, freight, spring and express wagons. The company employ 100 men, and turn out about 3000 wagons a year.

Nelson Furnace, at Shoals, Ind., was blown in on the 20th ult. Bituminous coal was formerly used for fuel at this furnace, but charcoal is now used. The stack is 60 feet high, with 13½ feet boshes.

No. 2 stack of the National Iron Company, at Depere, Wis., yields a weekly product of 175 tons of Bessemer iron. No. 1 is still undergoing repairs, and will not probably be blown in until next spring.

The extensive reaper and mower works of Amos Rank & Co., at Salem, O., are now being moved to Canton. The company has purchased the grounds and buildings of the old Canton Steam Engine Works.

The Buckeye Agricultural Works, Springfield, O., are putting in a new engine and boiler of increased power.

Articles of association of the Quaker City Iron Works were filed with the Secretary of State at Indianapolis, October 25.

The Litchfield (Ill.) Car Works now furnish employment for 200 men.

The Racine (Wis.) Wire Cloth mills run ten looms and employ fourteen men, and made last year over 300,000 feet of wire cloth. The business aggregated some $150,000.

MIDDLE STATES.

The locomotive which is to take a train from New York to Pittsburgh in 10 hours left that city a few days since for the East. The train will not stop during the trip, unless compelled to do so by some accident. It is one of the largest locomotives owned by the Pennsylvania Railroad, and has a fuel car similar in appearance to a baggage car, in addition to the tender, which will carry sufficient coal for the trip. The trial trip will take place immediately.

The Scranton, Pa., *Republican*, of October 27th, contains a description of the new steel works attached to the establishment of the Lackawanna Iron and Coal Company, in that city, which were formally opened on the 23d ult. The dimensions of the building are described as follows: It consists of a cupola room 44 feet span, 71 feet long and 49 feet high to eaves; a converting room 84 feet span, 124 feet long and 31 feet high; an engine room 54 feet span, 77 feet long and 16 feet high; a boiler room 46 feet span, 73 feet long and 16 feet high to eaves, all arranged so as to form a rectangle of 124 by 120 feet.

The Pittsburgh Manufacturing Company's works are running full. They are now filling an order for a number of nail machines for the Ohio City Iron and Nail Works.

The Cambria Iron Company, of Johnstown, Pa., intend to erect a spiegeleisen furnace. There are now only two such furnaces in this country, located in New Jersey.

The Lebanon rolling mills have at present 153 men employed, and are running day and night. There was more iron turned out week before last than at any other time previous.

The proposition made by the Philadelphia & Reading Coal and Iron Company to the furnaces on the line of the Reading Road to furnish them the coal, ore and limestone needed, and take the pig iron, paying a fixed price per ton for manufacturing, has been accepted by eight furnaces having an annual capacity of 50,000 tons. They will blow in next month.

Some of the Pittsburgh, Pa., foundries and machine works have received a considerable number of orders. The works of J. L. Lewis, Tenth street, South Side, are engaged on large orders of roll trains, shears, and a good amount of general rolling machinery.

Steel is now being made at the works of the Pittsburgh (Pa.) Refining Co., by the Hach process, from refuse scrap iron of the lowest grade, at a very slight cost. They are making steel ingots and steel pigs, and have been quite successful so far.

The Edgar Thomson Steel Works made 99 blows last week, running single turn, producing 457 390-2240 tons of rails. From the 1st of October to the 23d, inclusive, the aggregate production was 1412 2060-2240 tons of rails.

The iron works at Cohoes, N. Y., are busy at the present time.

The well known firm of Weimer & Birkinbine, of Lebanon, Pa., machinists and engine builders, constructors of blast furnace and rolling mill machinery, etc., has recently been dissolved, Mr. Birkinbine retiring. The business will be continued by Mr. Weimer. This establishment, known as the Weimer Machine Works, has become justly celebrated among iron masters for the excellence of its work, many improvements in engines and blast furnaces having originated there. There is hardly a section of the Union for which work has not been done by this firm, either in the shape of railroad cars or furnace equipments. Mr. John Birkinbine will act as agent for the establishment in Philadelphia, having his office at 152 South Fourth street, in connection with the practice of his profession as hydraulic engineer. Having personal knowledge of Mr. Birkinbine's ability, we commend him to those of our friends who need assistance in his line. He is an accomplished engineer and a perfect gentleman. —*Bulletin of the Iron and Steel Association.*

On Oct. 1 the subsidy granted by the United States government to Commodore Garrison's Brazil line of steamers expired, and the King line, of Baltimore, having offered to take the mails for ocean postage, the Post Office Department refused to renew the subsidy and the line was discontinued. Great inconvenience has resulted to New York merchants, but it is now announced that a new English line of iron screw steamers will soon be put on between this city and Brazil, the first vessel leaving here on Dec. 20. There will be three vessels in the new line, two of which are building in England. They are the Nellie Martin, 2500 tons; the John Bramall, 2300 tons, and the J. B. Walker, 2500 tons. The first is finished, and she sailed recently from Newcastle for this city. Accommodations will be furnished for 75 first-class passengers each trip. J. B. Walker & Co., of Newcastle, are the owners, and J. S. Tucker, of No. 54 Pine street, is the agent. The latter has made arrangements to take the New York mail direct for ocean postage, the owners having been promised a subsidy by the Brazilian government.

The Elmira Iron and Steel Company are preparing to start up their furnaces.

It is expected the Bechtelsville, Pa., Iron Company will blow in their new furnace in four or five weeks.

Byers, McCollough & Co., of Pittsburgh, Pa., have added a very large roll lathe to their mill—made by J. L. Lewis.

The Crane Iron Company, Catasauqua, Pa., are casting pipes for hot blast ovens which will weigh between two and three tons each. No. 5 furnace of this company is averaging a yield of 350 tons No. 1 iron per week. The large pump manufactured at the company's shops for the Manhattan Iron Mining Company, was shipped the other day to New York State, and will be placed in position before winter sets in.

The large hammer in the mill of Phillips, Nimick & Co., South Side, Pa., which was broken some five weeks ago, was put in operation again recently.

The small Allentown, Pa., rolling mill, which resumed operations quite recently, is running double turn, and it is said arrangements are being made to start the large mill.

A man named Forker, at Elenburgh, Pa., is putting up the largest blacksmith and machine shop in the oil regions. The blacksmith department is to be 100 feet square; the machine shop the same.

The Lebanon, Pa., rolling mills have at present 153 men employed, and are running day and night. There was more iron turned out week before last than at any other time previous.

In a recent issue, among "Business Items," we stated that the Cuyahoga Falls Rivet Co. had made a contract for a year to supply the Whitman & Miles Mfg. Co. We have since been informed that the Old Colony Rivet Works, No. 34 Warren street, New York, and Kingston Mass., have been supplying the Company named above since 1868, and have contracted with them for their yearly supply. We take pleasure in making this correction.

The Pottstown (Pa.) Iron Company have completed the improvements to their furnace, and will blow in some day this week. The cupola has been raised about 10 feet, a new hot air blast has been erected and other improvements have been made which will render this one of the finest furnaces in the Valley of the Schuylkill.

Notwithstanding the dull times, the Messrs. Riehle Brothers, proprietors of the Philadelphia Scale and Testing Machine Works, have built a large scale factory on Ninth street, above Master, Philadelphia, to which they have removed. Their growing business warranted the increase of their facilities for the manufacture of their patent scales and testing machines.

The National Tube Works Company, McKeesport, Pa., are now manufacturing 200 or 300 gas tanks, of seamless wrought iron, 14 inches in diameter, for the Pennsylvania Railroad, for carrying gas to light their passenger cars. These were formerly made of riveted sheet iron.

The Allentown, Pa., *Chronicle* says: Seven acres of land are covered by the pig iron owned by the Allentown Iron Company, and kept in stock at the company's works, in this city. This is the largest stock, numbering thousands of tons, ever collected at one time by any furnace company in the Lehigh Valley.

The Southwark Foundry, the property of Mr. Henry G. Morris, bankrupt, has been sold by the sheriff of Philadelphia to the Messrs. Merrick, for $291,000, subject to a mortgage which they hold on the property for $322,000. The total cost of the foundry to the purchasers is, therefore, $613,000.

EASTERN STATES.

The Holyoke, Mass., Machine Company are putting up a 45 inch 150 horse-power Boyden turbine wheel for the Androscogging mills at Lewiston, Me.

Among recent failures is that of Cyrus Carpenter & Co., of Boston, manufacturers of furnaces and ranges, and Charles H. Parker & Co., of Boston, proprietors of the National Bridge and Iron Works.

Lewis & Beecher, of New Haven, Conn., have had the honor of making a pontoon bridge for the army of the Khedive of Egypt.

The iron and steel works in Birmingham, Conn., began work recently with five furnaces in full blast. The workmen have consented to the 10 per cent. reduction in wages.

Notwithstanding the dullness prevailing in trade circles, some special industries are fully employed. The Globe Nail Co., Boston, Mass., are turning out about five tons of Horse Nails every ten hours, and even at this rapid rate of production they find themselves unable to catch up with their orders. They contemplate increasing their facilities by the addition of new machinery at an early day.

SOUTHERN STATES.

They are getting ready to make chrome steel at the Swift Iron and Steel Works, at Newport, Ky. There are 24 fires.

The Etowah Iron Works, at Rome, Ga., after working all the ore on hand, have temporarily closed.

Natural Gas.

We condense the following from the Pittsburgh *Commercial* of the 5th instant:

At a quarter to two o'clock on Wednesday a special train left the West Penn depot, in Allegheny city, carrying some fifty leading iron manufacturers and capitalists of this city to visit the Delamater and Burns or Duffy gas wells, in Donegal township, Butler county, owned by Messrs. Kirk & Dilworth, the trip being made at the invitation of the latter gentlemen.

The train reached Butler a little before four o'clock, and the party immediately took carriages and drove out to the wells, a distance of about ten miles, reaching the first one—the Burns or Duffy well, on the old Duffy farm—at half-past five. This well was struck some months ago, and has thrown out a vast amount of gas. Four pipes had been laid some distance from the well into the valley below, each pipe having two burners at its end. These were lit, after our arrival, and presented a grand sight. The flames shot high into the air, nearly every hue of the rainbow being shown in the blaze. The escaping gas roars so loud that it is impossible to carry on conversation near the well.

The party moved on about a mile to the Delamater well, on the Charles Duffy farm, which is estimated to be discharging twice as much gas as the Burns. Here four pipes, two of two inch and two of three and a quarter inch diameter, running thirty yards from the well, were burning, throwing light over a great expanse. In addition to this great flow, an engine of twelve horse-power was run by gas pressure alone, and a large pipe connected with the tubing allowed a vast amount to escape.

The pressure at the Burns well is so great that all attempts to test it have failed, as it is impossible to confine the gas. Even could they succeed in doing the latter, the force of the flow would be so great as to shatter the heavy iron tubing, and thus ruin the well. A pressure gauge was put on the top of the tubing at this well when gas was flowing below from four two inch pipes, and found to register three hundred pounds to the square inch. It is estimated that the full pressure is nearly, if not quite, nine hundred pounds to the square inch. That of the larger well is, of course, much greater. The escaping gas from these wells makes a noise like the rushing of a mighty body of water. This can be heard, on a still night, a distance of fifteen miles. The light from the burning gas can be seen on a clear, dark night, from the hills about this city.

The stories, heretofore considered apochryphal, about the heat from burning gas wells starting vegetation in winter, were here demonstrated to be true. For twenty feet around the burning gas everything was burned away, but beyond that for a considerable space, the grass was growing nicely, and as fresh and green as in May. Beyond this again it was withered and brown, and in some spots covered with snow.

At the last meeting of the Car Builders' Association, held in this city, an interesting statement was made by Mr. W. W. Lobdell, secretary of the Lobdell Car Wheel Company, of Wilmington, Del. He said that a pair of chilled cast iron truck wheels had been in use on the Baltimore Central Railroad, Pennsylvania, for nearly a year, and had run from 13,000 to 14,000 miles, when one of them developed a "spot," which made it necessary to remove it. It then occurred to him to try the experiment of turning off the pair of wheels, as the manufacture and turning of chilled rolls has for a long time been a part of his firm's business, and Mr. Hodgeman, master mechanic of the railroad, agreed to put them under an engine. They were 26 inches in diameter, and about three-sixteenths of an inch was turned off, so that their diameters were reduced about three-eighths of an inch. The tool used was a sort of scraper the full width of the tread of the wheel, and was made of ordinary tool steel hardened by a patented process. The engine has now run about 11,000 miles with these wheels, and they have worn perfectly smooth, with hardly any apparent wear. In turning them, the "spot" referred to was not entirely turned out, and he had watched carefully to see whether it had increased in size, and found that it had not; but the marks which remained after being turned had almost entirely disappeared. The cost of turning a chilled wheel, including a fair charge for the use of machinery and tools, was about $7·50. As his appliances were somewhat imperfect for this purpose, he thought that with the right kind of a lathe it could be done at a much lower cost.

A Novel Plan of Co-operation.

There is an association of young people, at Springfield, known as the Industrial Works, that furnishes all its members with constant work at fair wages, and a pleasant home at a small cost, which is meeting with a success so marked as to attract the attention of all thinking people. The members of this association are all young persons who are willing to rid themselves of all bad habits, work steadily, dress economically, and save a portion of their wages. No others are taken. All the men who join are required to furnish a small amount of capital, and save one-fourth of their wages, which must be invested in the capital stock of the company. Women are not required to furnish any capital at the outset, but must save one-sixth of their wages and invest it in the business. Those who do not comply with the requirements of the association are expelled, and those who wish to leave can do so at any time, and can withdraw their capital by giving six months' notice. The wages paid to each member is fixed by a board of directors, and is proportioned to their skill and ability. They have a large dwelling or home, where the members live and enjoy many privileges and comforts not usually found in families or boarding houses. All pay a moderate price for their board from their wages. They have two new factory buildings and a good water privilege and considerable machinery, and are engaged in the manufacture of toy and house furnishing goods, for which they find a ready sale. They began business a year ago with five hands and are now running forty-five. The sales for the past month were a little over $3000; the pay roll for the month was over $1200, and the saving of wages which was added to the capital of the company was more than $300. The average amount saved from the wages of each man, in a year, is $150, and of each woman $50. Many of the members have saved much more than this during the past year, but that is all that is required of them. The aggregate amount saved by the present company in a year will be nearly $5000. By continuing in this course a few years, the capital of the company must become very large, and the savings of each member a respectable competency.

Our English newspapers have curious ideas on some points. Captain Webb swam across the English channel, benefiting neither himself nor anybody else, and straightway John raised a purse of several thousand pounds for him, and almost deified his pluck. On the other hand, Elijah Hallum, a poor, illiterate miner, lately took his life in his hand, went deliberately six times down a shaft filled with deadly vapors, and each time returned with another human life in his arms. The papers gave him half a dozen lines of half-hearted praise, and an appeal for a testimonial for him resulted in an aggregate contribution of less than six pounds.

Special Notices.

HARDWARE BUSINESS
For Sale.

In the city of Norwich, Conn, an old stand facing two streets. Rents low. Good help and doing a prosperous business. Large back country. The best of reasons given for selling. Address,
FULLER & PARISH, Norwich, Conn.

Complete Illustrated Catalogue free.
Fine Machinists' & Amateur Tools
AND SUPPLIES OF ALL KINDS.
Foot Lathes, Foot Power Scroll Saws, Centennial Foot Grindstones, Taps and Dies, LeCount's Lathe Dogs, Morse Twist Drills, &c.
Discounts to Trade. **JACKSON & TYLER,**
No. 16 GERMAN ST., BALTIMORE, MD.

An Experienced Traveler

going South to solicit orders for Pen and Pocket Knives, Razors, etc., would like a manufacturer of Table Cutlery or Hardware to furnish a full line of samples, and bear a portion of his salary and expenses. Apply by letter:
Address, *"CUTLERY,"*
Office of *The Iron Age*, 10 Warren St., N. Y.

Wanted,

By a capable and energetic business man, about going to San Francisco, Cal., an agency for any desirable patent or manufactured articles. The writer has an extensive acquaintance in general mercantile and manufacturing businesses, and intends devoting his whole time to the general agency business. First-class reference can be given. Persons desirous of employing such a one will address, for 10 days,
P. O. Box 693, Pittsburgh, Pa.

Wanted,

By a stock company located near New York, having machinery, power and tools for manufacturing all kinds of Brass Goods, association with a party having an established trade, with limited facilities and capital, or good invention, which they would like extended and introduced. Address
ENTERPRISE,
Office of *The Iron Age*, 10 Warren St., N. Y.

To Hardware Manufacturers.

$75,000 TO LOAN.—A gentleman desires to loan the above amount among manufacturers who will secure him their agency; is thoroughly familiar with the Hardware, Iron and Metal trades, and has traveled West and South for 17 years. References undoubted. Answers treated strictly confidential. Address, for two weeks,
"BONA FIDE," Box 10,
Office of *The Iron Age*, 10 Warren St., N. Y.

To Hardware Merchants.

I have been many years established in business in this city, as a dealer in general Hardware, Tools, Machinery, Miners' Supplies, Agricultural Implements, Pumps, Wagon Makers' Goods, and Manufacturer.
Now, as I find my business increasing, I want to treat with a wholesale house in or near New York, whose principal firm is in England, that will supply me with all the foreign goods I want. Good reference offered. State your terms and address
J. W. BALL,
Carroceria Herreria Inglesa,
Durango City, Republic of Mexico.

Special Notices.

Bargains in Machinery
NEW AND SECOND-HAND,
FOR SALE BY
S. C. FORSAITH & CO.,
MANCHESTER, N. H.

New Machinery.

Excelsior Machine, $275; Power Matcher and Jointer, $250; Shingle Mills and Jointers, $285; 30 in. heavy Rotary Bed Planer, $650; 26 in. Rotary Bed Planer, $235; 24 in. Planer, $190; Woodworth Planer and Matcher No. 3, $1000; Woodworth Planer and Matcher No. 0, $760; Woodworth Planer and Matcher No. 2½, $840; Excelsior Planer and Matcher, $410; Woodworth Surfacer, $345; 3 Side Monitor Molder, $525; 4 Side Molder "Balls," $360; 4 Side Sash Molder, $208; 3 Side Sash Molder, $140; "Ball's" Rail Car Mortiser and Borer, $440; Door Mortiser and Borer, $175; 2 No. 4 Wood Frame Tenoners, each $240; Blind Stile Tenoner, $80; Hor. Rail Car Borer, $80; 20 Hand Boring Machines, each $4; Wright Scroll Saw, $115; Rollstone Scroll Saw, $90; Iron Frame Band Saw, $150; 20 in. Pattern Makers' Lathe, $100; 24, 20 and 12 inch Wood Turning Lathes, $96, $87 and $60; Butting Machine "Balls," $68; No. 3 Dowel or Rod Machine, $34; Hor. Cornering Machine, $45; Cylinder Stave Saw Machine, $75; Iron Frame Railway Cut-off Saw, $92; Box Board Matcher, $65; lot of Steel Saw Arbors from $12 to $21 each; 3 Knife Grinding Machines, $16 each; 2 Emery Grinding Machines, $15 and $30.

Second Hand Machinery.

3 Complete Circular Saw Mills, $530, $380 and $310; 2 Patent Saw Mill Set Works, $80 each; Up and Down Saw Mill, with 3 24 in. Whitney Wheels, $360; "Perry" Shingle Mill and Jointer, $155; Shingle Mill, $55; Lath Sawing Machine, 3 Saws, $185; 26 in. double belted Rotary Bed Planer, $240; 24 in. Rotary Bed Planer, $170; 16 in. Planer, $90; Daniels' Planer, 28 ft.x28 in., $175; No. 2—3 side "Rogers" Molder, $325; No. 2—4 side "Lee" Molder, $520; Sash and Blind Sticker, 1 side—$115; No. 2 Smith Power Mortiser, $135; No. 2 Smith Tenoner, $175; Smith Blind Stile Borer, $63; 2 Small Boring Shafts and Bits, $16 each; Box Board Matcher, $40; Iron Frame Blanchard Spoke Lathe, $225; Felloe Machine, $50; Stretching Machine, $75; Cut-off Saw Arbor and 20 in. Saw, $16. Shoe Peg Machinery as follows: Sawing and Heading Machine, with 36 in. taper-ground Saw, $135; Baldwin Pointer, 8 rolls, good as new, $137; Baldwin Splitter, with ratchet feed, $40. Boring Lathe for cutting out knots, $25; Bleaching Furnace and Fan, 18 in., $35; Steam Dryer and fixtures (new), containing over 600 ft. ¾ in. Pipe, copper covered, made in the most thorough manner, 35 Bushel size, $375; Screens, good order, $37. The seven Machines for $740, if wanted by one person.

Engines in Good Order,

as follows: 60 h. p. Sta. hor., $1100; 40 h. p. Sta. hor., $740; 50 h. p. "Chubbuck," $1200; 40 h. p. Upright, $700; 2—35 h. p. Portables, $1500 and $1400; 30 h. p. Portable, $1270; 3—25 h. p. Portables, $1475, $1525 and $1300; 25 h. p. Sta. hor., $625; 2—18 h. p. Portables, $1000 and $950; 10 h. p. Upright Hoisting, $610; 8 h. p. Sta. hor. (with Boiler), $525; 6 h. p. Portable, $475; 3—5 h. p. Portables, $445, $275 and $250; 3 h. p. Caloric, $250; 2½ h. p. Sta. (with Boiler), $200; 1 (new)—1½ h. p. Portable, $185.

Boilers in Good Repair and Complete.

80 h. p. Hor. $1000; 2—60 h. p. Hor., each $425; 4—50 h. p. Hor., each $500; 1—45 h. p. Hor., $700; 12 h. p. Upright, $200; 10 h. p. Upright, $176.

Grist Mills.

1—36 in. "Platt" Portable, $220; 1—30 in. "Platt" Portable, $200; 1—24 in. "Olds" Portable (new stones), $237; One Run Stones, 4½ ft. diam., $50; or same with curb, hopper, elevator and pulleys, $68; 1 Run, 4½ ft., French Burrs.

Machine Tools, Good Order.

Planer 12 ft.x36 in.x32 in., $800; Planer 7 ft. x24 in.x24 in., $400; Crank Planer, 2 ft. bed, 14 in. stroke, $345; Upright Spliner, 5 in. stroke, $90; New Milling Machine, platen 15x8, $387; Putnam 24 in. Gear Cutter, $500; Upright Drill, 52 in. swing, $325; Ditto, 56 in. swing, $250. Engine Lathes as follows: 1 (new) 25½ ft. bed, 36 in. swing, $1550; 16 ft.x31 in. swing, $660; 15½ ft.x30 in., $630; 12½ ft.x30 in., $500; 16 ft.x24 in., $240; 12 ft.x24 in., $425; 9 ft.x15 in., $240; 6 ft.x15 in. $230; 8 ft.x17 in., $215. Double headed: 15 ft.x20 in., 11 ft.x12 in. and 16 ft.x20 in., $350, $155 and $250; 8 ft.x20 in., $290; 5 ft.x14 in., $195; 5 ft.x15 in., $210; 8 ft.x17 in., $240; 6 ft.x17 in., $225; 4 ft.x9 in., $140. Speed or Drill Lathes as follows: 5 (new) 6 ft. x12 in., each $75; 6 ft.x13 in., $50; 2 ft.x9 in., $55; 3 ft.x8 in., $35; 5 ft.x18 in., $75; 6 ft.x 14 in., $50. New "Oneida" make of Chucks: 24 in., $105; 15 in., $50, and 12 in., $42; No. 4 Wiley & Russel Power Bolt Cutter, $170; 1—7 ft. helve iron frame Trip Hammer, $150; 1 Japanning Oven, $20.

Miscellaneous.

1 Horse Power, with wood sawing rigging, $165; Hydraulic Presses and Pumps, weighing

Special Notices.

13,000 lbs., $650; No. 2 "Knowles" Pump, $85; No. 4 "Blake" Pump, $220; No. 1 "Selden" Pump, $80; 5 ft. Whitney Water Wheel complete, $400; 5 ft. Blake Wheel complete, $375; 3 ft. Whitney Wheel, $275; 1 No. 7 Sturtevant Blower, 4 ft. diam., with steam Boiler for drying Wool by heated air, almost new, cost $1100, price $450. Lot ⅝ in. Iron Chain, 4½c. per lb. Also lot of Shafting, Pulleys, Hangers, &c.
For further particulars and printed list, address,
S. C. FORSAITH & CO.
Manchester, N. H.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**
DEEP RIVER, Conn., Sept. 7, 1874.

WANTED TO PURCHASE,
100 tons good Second-Hand T Rails, 18 or 20 lbs. per yard.
Address, giving particulars,
PIPER & THOMPSON,
Lapeer, Mich.

TO LET,
A Light, Handsome Office.
Possession Immediately.
HERMANN BOKER & CO.,
101 Duane Street, N. Y.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*
SCALE: First 3 lines, 8/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to
CHESTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.

NEW HARDWARE STORE,
At NATCHEZ, MISS.
Manufacturers and Jobbers please send price lists, &c. I want the agency for any good paying article. Can give good references, in Natchez, New Orleans and elsewhere.
Address, **A. L. PERRAULT.**

AN IRON COMMISSION HOUSE

Having an established connection in London, wish to represent through Europe some American Manufacturer of Agricultural Implements or something similar. Only a first-class article will be taken up.
Addr ss **B. A. J.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Important to Manufacturers.
BISSELL, WELLES & MILLET,
Auctioneers and Commission Merchants, No. 15 Murray St., New York,
Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

25 per cent. extra power
Guaranteed to owners of **Steam Engines**, or an **Equal Saving of Fuel**, or a **Reduction of Boiler Pressure**, by applying
Ransom's Syphon Condenser.
T. SAULT, Consulting Engineer,
General Agent, New Haven, Ct.

Business Opportunities.

New Capital Procured, Partnerships Arranged, and Commercial, Mining and Banking Corporations Organized, by
CLARKE, CHITTY & CLARKE,
Board of Trade Offices, New York.
P. O. BOX, 4071.

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.
GILCHRIST & GRIFFITH,
Mount Pleasant, Iowa.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for all kinds of **Metals** and **Tools.**

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of
Iron and Steel Drop Forgings
in quantities to order at reasonable rates.
HERMANN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.
A practical man with means is wanted to join a practical man who is already well established.
Address *CAR WHEEL FOUNDRY, P. O. Box 134, Selma, Alabama.*

Special Notices.

Briesen's Patent Agency
FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE,
No. 258 Broadway, New York.
A. V. BRIESEN.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,
IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

DISCOUNT LISTS.
Hinges and Butts. { Stanley Works' 1st...10 % to 50 % each, 75c. / Union Mfg Co.'s.....10 % to 60 % " 75c.
Bolt, File and Hinge and Butt List.—Contains all the lists and discounts that are used.....Price $1 00
Dayton & Lamberson, 97 Chambers St., N. Y.

CLASSIFICATION LISTS
OF
American Hardware.

A book of tables and information of use to every one in the Hardware trade.
PRICE, $1·00 PER COPY.
Send cash for the book, or write for circular giving table of contents. Also Discount Glass Lists, 75c. each. Address, **WM. R. HULL,**
Detroit, Mich.

For Sale.

For Sale,
Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 12 men.

Present Stock about $6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address
HORSMAN & HORSMAN,
Iron and Hardware Merchants,
St. Thomas, Canada West.

ELEY BROS.,
Brown Cartridge Cases, 10 Gauge, for Pin Fire Breech Loaders,
FOR SALE CHEAP.
ALFRED FIELD & CO.,
93 Chambers and 75 Reade Streets, N. Y.

FOR SALE.
At Lowest Manufacturers' Rates,
GUNS & SHEET ZINC,
Best German and Belgian Brands,
By *LOUIS WINDMULLER & ROELKER,*
20 Reade Street, N. Y.

For Sale, &c.

FOR SALE.
Rolling Mill and Bridge Building Machinery,
Of NEW ENGLAND IRON COMPANY.

Upright Corliss Engine, 32 in. cylinder, 5 ft. stroke; wheel, 32 tons, 25 ft. diam.
Puddling Train, Merchant Train, 16 in., built by Totten.
Rotary Squeezer, Etc., Etc.
Testing Machine.
Bolt Cutters.
Milling Machines, and all Machinery necessary for Bridge Work. In lots to suit Apply to
WM. E. COFFIN & CO.,
8 Oliver Street, Boston.

Valuable Furnace Site
FOR SALE OR ON ROYALTY,

Possessing ingredients to make Car Wheel Charcoal Pig at $14·75 per ton. Any head of water power, Forest, Iron Ore 70 per cent., Limestone, Clay, Refractory Stone for construction abound together, same property; makes best neutral flange iron.
H. C. WYETH, Baltimore, Md.

For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington, Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an "A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about $15,000. Will be sold at a sacrifice. Ample reasons given for selling. For further information, address,
GEO. BRADNER, Bloomington, Ills.

FOR SALE.

An ⅜ inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.
Apply to **W. W. JONES,**
Near the Lehigh Valley Railroad Depot,
Allentown, Pa.

A **BLAST FURNACE FOR SALE** at Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a capacity of 20 tons per day Anthracite or 15 tons of Charcoal, together with a splendid water-power, goes with the furnace. The furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.
Address, **H. BANGE,**
94 Gold Street, New York City.

FOR SALE,

at 10c. a copy, Weekly Spanish Review and Prices Current. The undersigned is also a *Translator* from and into the English, Spanish, French and German. *Latest Translations made:* for the governments of Germany and Spain. Pacific Mail S. S. Co., Walter A. Wood; Morris, Wheeler & Co.; Todd & Rafferty; John T. Dunkin; Fisk & Hatch; R. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marquardt; M. Echeverria & Co., and Chas. E. Little, New York; Hocking Valley Mfg. Co.; W. F. Potts, Son & Co., Phila.; Atlantic and Pacific Land Co.; B. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), to whom he refers.
C. KIRCHHOFF,
Metal Reporter of "The Iron Age,"
Box 3091, New York P. O.

A VALUABLE
Manufacturing Establishment
FOR SALE.

The undersigned, who also compose the Blake Crusher Co., desiring to give their exclusive attention to the manufacture of their patent machines for stone and ore crushing, offer for sale their valuable and extensive Hardware Manufactory on liberal terms. A rare chance is thus offered to any competent person or company wishing to step into a business having an established reputation and "good will" of nearly fifty years accumulation, and unsurpassed in the quality of goods produced by any concern in the manufacture of hardware in this country.

The property is located in the town of New Haven, Conn., and comprises a good water-power and privilege; a 25 horse-power Steam Engine; extensive foundry and machine shops, with machinery, tools, &c., all in good order, and in full operation, adapted to carry on a large and profitable business. A large stock of goods finished and in progress will be sold with the property if desired.

As it is not the intention of the undersigned to abandon the business unless the property should be sold, the works will be continued in operation and all orders received and filled as usual. We are about bringing out several new styles of goods and a new illustrated catalogue, and as we are determined to maintain unimpaired our long established reputation of furnishing the best and most substantial goods in the market at prices as low as any, we solicit continued orders from our old customers, and as many new ones as have become tired of the flimsy imitations of our goods with which the market has been flooded. Catalogues, price lists, &c., will be sent on application. We are selling off our old stock of **CASTERS, WINDOW PULLEYS, &c.,** at very low rates.

The attention of Dealers is invited. Address,

The Blake Brothers Hardware Co.,
No. 85 Orange Street, NEW HAVEN, CONN.

Trade Report.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, Nov. 10, 1875.

The past week has been comparatively uneventful in financial circles. The money market during the early part of the week was active, and the rate on call loans advanced to 7 per cent., but it quickly declined to 2½ @ 3 per cent. On good business paper the discount rate is 6 @ 7 per cent.

In the gold market the course of the premium has been steadily downward, though without important fluctuations. On Thursday the sales of $500,000, on account of the Treasury, were made at 115·02 @ 115·19. The bids amounted to $1,532,000. The following is the course of the premium:

	Highest.	Lowest.
Thursday	115⅜	114⅞
Friday	115⅜	114⅞
Saturday	115⅜	114⅞
Monday	115⅜	114⅞
Tuesday	115	114⅜
Wednesday	114¾	114⅜

In this market the price of government bonds has declined in sympathy with gold; in London the decline was due to an unsettlement of confidence, owing to the Turkish default and other causes. Railroad mortgages have been irregular, but in the main strong.

The stock market has been dull and pervaded by a feverish tone, but the speculators for an advance have been, in the main, ascendant. The principal dealings have been in Lake Shore, Pacific Mail, Northwestern, Union Pacific and Western Union.

The result of the late State elections show very clearly that the currency question is paramount as a political issue, and that the sentiment of the country is unalterably in favor of national good faith, and a resumption of specie payments, by whatever means may be best and easiest. Next to this in importance is governmental economy and a retrenchment in every direction in which retrenchment is possible. Before the war, with a population of 30,000,000, the expenses of the government, including those of the Post Office Department, was $80,000,000. To this must be added interest on the public debt amounting to $18,000,000. Now, with a population only ten millions greater, it costs to run the government $210,000,000, including the Post Office Department, and we must also pay interest on the public debt to the amount of $104,000,000. Thus, with an increase of population of only 25 per cent., we have an increase of over 160 per cent. in the cost of the government. Part of this increase is, of course, legitimate; much of it is not, and the tax burdened public are beginning to demand exemption from every dollar of unnecessary taxation. The same extravagance characterizes the expenditures of State and municipal governments, and the issues of the next national canvass will undoubtedly be honest redemption and specie payments, and economy in all departments of the government. These are signs of a wholesome public sentiment which promise well for the immediate future. The advocates of inflation are nursing a dead hope if they expect to renew the issue vetoed by the people of Pennsylvania and Ohio. Let them now espouse the cause of honest reform, and future success will atone for past political mistakes.

The bank statement reflected a large loss in legal tenders, due to shipments to the interior, and an offsetting gain in specie of $3,324,600. The banks made a net gain during the week of $969,950, and now hold in lawful money, in excess of 25 per cent. requirements, $9,077,200. The following are the comparative totals:

	Oct. 30.	Nov. 6.	Differences.
Loans	$275,894,900	$277,555,800	Dec.. $669,900
Specie	9,990,900	13,945,500	Inc... 3,324,600
Legal tend's	53,455,400	51,314,500	Dec.. 2,140,900
Deposits	221,076,200	221,931,200	Inc.. 855,000
Circulation	17,997,700	18,039,400	Inc... 41,700

The foreign trade movements for the week are shown in the following tables:

IMPORTS.

	1873.	1874.	1875.
Total for week	$5,022,754	$7,771,028	$3,310,530
Prev. reported	338,466,015	332,185,779	281,848,537
Since Jan. 1	$343,488,769	$339,956,867	$285,159,057

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value
Brass goods	5	$1,606
Bronzes	29	4,660
Chains and anchors	56	1,979
Copper		67
Cutlery	50	23,406
Guns	67	12,939
Hardware	23	2,890
Iron, pig, tons	700	13,571
Iron, cotton ties	1,351	3,752
Iron, other, tons	11	1,303
Metal goods	133	16,037
Needles	11	3,318
Old metal		1,963
Platina	1	3,591
Per. caps	5	1,109
Saddlery	8	892
Steel	1,001	17,606
Silverware	3	446
Tin, boxes	10,367	60,963
Tin, 593 slabs	69,956	10,638
Wire	210	4,669
Zinc	55,000	3,583

EXPORTS EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
For the week	$7,229,773	$5,161,241	$5,815,233
Prev. reported	250,359,474	245,631,598	212,062,359
Since Jan. 1	$257,589,247	$250,792,839	$217,877,592

EXPORTS OF SPECIE.

Total for the week	$375,220
Previously reported	10,876,571
Total since January 1, 1875	$11,251,791
Same time in 1874	5,437,864
Same time in 1873	15,102,494
Same time in 1872	5,329,402

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	123¼	124
U. S. 6s 1881, reg	120¾	121
U. S. 6s, 1881, cou	123¾	123¾
U. S. 5-20 1862, reg	114¾	114¾
U. S. 5-20 1862, cou	114¾	114¾
U. S. 5-20 1864, reg	114¾	114¾
U. S. 5-20 1864, cou	114¾	114¾
U. S. 5-20 1865, reg	115½	116
U. S. 5-20 1865, cou	115½	116
U. S. 5-20 1865, reg. new	118½	118¾
U. S. 5-20 1865, cou	118¾	119
U. S. 5-20 1867, reg	120¾	120¾
U. S. 5-20 1867, cou	120¾	120¾
U. S. 5-20 1868, reg	121	121¼
U. S. 5-20 1868, cou	121	121¼
U. S. 10-40 reg	115¼	115½
U. S. 10-40 cou	116¼	116½
U. S. 5s, 1881, reg	115¼	115½
U. S. 5s, 1881, cou	115½	115½

The closing quotations of stocks were as follows:

	Bid.	Asked.
Atlantic & Pacific Preferred	5	5¼
Atlantic and Pacific Telegraph	18¼	19½
Chicago & Northwestern	38¾	38¾
" " Pref	52½	52⅞
Chicago, Rock Island and Pacific	104¼	104⅜
Chicago, Bur. & Quincy	112	112⅛
Col., Chic. & Ind. Cent	5	5¼
Clev., Col., Cin. & Ind's	59½	60
* Cleveland and Pittsburgh	88¾	89¼
Chicago & Alton	96	97
" " Pref	105	106
Canton	37	40
Del. Lack. and Western	118	118½
Delaware & Hudson Canal	120¾	120¾
Adams Express	101¾	102
American Express	58¾	58½
United States Express	45	46
Wells, Fargo & Co. Express	78½	79½
Erie	17	17⅛
Harlem	132½	133
Hannibal & St. Joseph	22½	23
" " Pref	25¾	25¾
Illinois Central	91	92½
Lake Shore	61⅞	62⅛
Michigan Central	66¾	67
Morris & Essex	102½	103½
Milwaukee & St. Paul	35⅞	35⅝
" Pref	64¼	64½
Mariposa	7¾	8¾
" Pref	9	10
New York Central	104⅜	104⅝
New Jersey Central	104	105
Ohio & Mississippi	17⅜	17½
" " Preferred	32½	33½
Pacific Mail	38⅞	39
Panama	135	138
Pittsburgh & Fort Wayne	97¼	97¾
Pacific of Missouri	14¾	14½
Quicksilver	17¾	18
" Pref	23	23½
St. Louis, Kan. City North'n	4	5½
St. Louis, Kan. City North'n Pref	27	28
Tol., Wabash & Western	5½	6¼
Union Pacific	68¾	69
Western Union Telegraph (ex'd)	76¾	76¾

* Ex dividend.

GENERAL HARDWARE.

We cannot report any improvement in the volume of business this week. As regards prices, the market continues firm. In Foreign Hardware there is little activity. The sterling price of English Coil Chain has advanced 6d., but the price in this market continues at former quotations.

The demand for Nails is not as active as it was a week ago; 10d. are quoted at $3 @ $3·10, net, according to quantity.

The Russell & Erwin Mfg. Co. have issued an illustrated price list of Real Bronze goods manufactured by them, selected from their large assortment, and presenting a complete line of a cheaper grade, adapted both in style and price for use on moderate price dwellings.

Spring Balances are quoted in this market in a regular way at discount 35 per cent. For large orders this figure would be shaded.

A. Field & Sons have issued the following circular, under date of 4th inst.:

No. 78 CHAMBERS STREET, NEW YORK,
November 4, 1875.

GENTLEMEN: Having been appointed by the Union Steel Screw Company of Cleveland, Ohio, their agents, in May last, for the sale of their *Patent Bessemer Steel Wood Screws*, we now desire to inform the hardware trade, and more especially our patrons, that while we are fully convinced that these Screws are far superior to any Iron Screws manufactured (we will warrant them to be such), both in strength and durability, we shall at all times sell them at the same prices, on the same terms, and with the same guarantee against decline that the American Screw Company offer.

Having a full stock in store, and relying on the *quality* of the Steel Screws to effect their sale, we respectfully solicit your patronage, and remain, dear sirs, yours, truly,

A. FIELD & SONS.

The Penfield Block Works, H. B. Newhall, Agent, have issued the following revised price list for their Wrought Iron Tackle Blocks. In their advertisement on page 13 they illustrate their improved Block with edges of shell turned out.

Improvements for 1875 consist in new design for shell, with wearing edges of shell rounded or turned out to prevent their cutting the rope, thus obviating the greatest objection ever made to blocks with iron shells; the sides are strengthened by outside iron straps, running full length of shell; hooks are forged from a superior brand of iron, are plated on sides, (English style), and have the utility of both stiff and loose swivels combined; sheaves are of iron, with deep polished grooves, common bushed, or patent (anti friction) steel roller bushed as ordered; pins are steel, turned to size, and are of uniform size for both common bushed, and patent bushed sheaves, thus making sheaves interchangeable, a convenience we think the trade will appreciate.

PRICE LIST, REVISED OCTOBER 20TH, 1875.

Diameter of Sheave.	Length of Shell.	Size of Steel Pin.	Width of Mortise.	Suitable for Rope, diameter	Price of 1 Sheave Block, see cut No. 171	Price of 2 Sheave Block, see cut No. 173	Price of 3 Sheave Block, see cut No. 175	Price of 4 Sheave Block, see cut No. 177	Chain Sheaves will take Chain	Price each for Iron Sheaves (only), POLISHED GROOVES, common bushed, for Repairs	Price each for Iron Sheaves (only), Patent Steel Roller, bushed, POLISHED GROOVES, for repairs, see cut No. 160	Price of Snatch Blocks, each	Suitable for Rope, diameter
Ins.	Ins.	Ins.	Ins.	Ins.	Each.	Each.	Each.	Each.					
3½	6	⅝	⅝	⅜	3 00	3 40	3 80	4 60		75	24		
4	7	⅝	⅝	½	3 65	4 00	4 40	5 20		1 00	30		
4½	8	⅞	1	⅝	5 00	5 60	6 40	8 50		1 25	40	4 50	⅝
5	9	1	1⅛	¾	7 00	7 60	9 00	11 70		1 50	50	5 50	⅞
6	10	1⅛	1¼	⅞	9 00	9 75	11 50	13 00		1 80	60	6 50	1
7	12	1¼	1⅜	1	11 00	12 00	14 00	15 00		2 25	80	7 75	1⅛
8	14	1½	1⅝	1⅛	13 00	14 00	16 00	17 00		3 00	1 20	10 00	1⅜
9	16	1¾	1⅞	1¼	15 00	16 00	18 00	19 00		4 00	1 75	12 00	1½
10	18	1⅞	2	1⅜	17 00	18 00	20 00	21 00		5 00	2 50	14 00	1¾
11	20	2	2⅛	1½	19 00	20 00	22 00	23 00		6 00	3 50	16 00	2

Discount from above list, blocks with iron sheaves, common bushed ..... 30 %
Blocks with iron sheaves, patent anti-friction steel roller, bushed ..... 15 %
Patent and common iron sheaves for repairs ..... 30 %

The 18 and 20 inch blocks are made with rings or hooks, as ordered.

One becket and thimble (only) are furnished with each combination without extra charge.

Blocks with lignum-vitæ or composition sheaves, patent or common bushed, furnished to order.

The manufacturers of Rivets have conformed their prices to the rates adopted by the American Screw Company. The following circulars have been issued:

OFFICE OF THE OLD COLONY RIVET WORKS,
No. 43 Warren street, New York,
November 1, 1875.

GENTLEMEN: On and after this date, our prices for Rivets will be as per revised tariff of July 1, 1874, with the following discounts:

Black and Tinned Iron Rivets and Block and Carriage Rivets ..... 55 %
Rivets in Bulk ..... 40 %

instead of the list, cash and quantity discounts heretofore allowed.

Terms—Net cash. No further discount allowed.

All goods delivered in Boston, New York, Philadelphia and Baltimore. Yours, truly,
OLD COLONY RIVET WORKS.

PLYMOUTH, MASS., NOV. 6, 1875.

GENTLEMEN—On and after this date, our prices for Rivets will be as per revised tariff of July 1, 1874, with the following discounts:

Black and Tinned Iron Rivets and Block and Carriage Rivets ..... 55 %
Rivets in bulk ..... 40 %

instead of the list, cash and quantity discounts heretofore allowed.

Terms—Net cash. No further discount allowed.

All goods delivered in Boston, New York, Philadelphia and Baltimore.

The above discounts do not apply to orders for lots of 100 lbs. or less, of other than regular sizes of Rivets. Very truly, yours,
COBB & DREW.

PLYMOUTH, MASS., NOV. 1, 1875.

GENTLEMEN: On and after this date our prices for Rivets will be as per revised tariff of January 1, 1875, with the following discounts:

Black and Tinned Iron Rivets and Block and Carriage Rivets ..... 55 %
Rivets in bulk ..... 40 %

instead of the list, cash and quantity discounts heretofore allowed.

Terms: Net cash. No further discount allowed.

All goods delivered in Boston, New York, Philadelphia and Baltimore.

The above discounts do not apply to orders for lots of 100 lbs. or less, of other than regular sizes of Rivets.

Thanking you for past favors, and soliciting a continuance of your orders, I remain, yours, very respectfully, SAMUEL LORING,
Proprietor Plymouth Tack and Rivet Works, Plymouth, Mass.

Henry Disston & Sons have issued the following circular. Some styles of their "Skew-Back" Hand Saws are illustrated in their advertisement on page 29:

Office of the KEYSTONE SAW, TOOL, STEEL AND FILE WORKS,
FRONT & LAUREL STREETS, PHILA., PA.

Henry Disston & Sons' New Patent Skew-Back Hand Saw, "Centennial No. 7."

To the Hardware Trade.—GENTLEMEN: We are prepared to supply the trade with an entirely new Hand Saw, called the "Centennial No. 7." This Saw is ground on the back, to taper gradually from butt to point, being only 26 gauge at the point. By this mode of grinding, the Saw, when tested, makes a complete "whip bend."

The handle is apple-wood, oil finish, the screws are flush and polished, and the Saw is superior to any ever offered to the trade in this or any other country at the price. It is the sweetest cutting, nicest hanging Saw that can possibly be manufactured, feeling as light as a feather at the point, owing to its peculiar construction. The screws are finished before being put into the handle, and, should they become loose, can be readily tightened with an ordinary screw driver, and still make a good finish.

It was our intention to keep this Saw from the market until Centennial year, but second thought has decided us to give the trade an opportunity to test it before then, that they may know whether they can put it in stock without risk.

The price of this Saw at present will be the same as that of the regular No. 7.

It is a "hard times" Saw, and we do not know how long the price can be sustained.

Mr. Henry Disston is willing to risk his reputation as a Saw maker upon "the Centennial No. 7.

Send for samples and put them in the hands of the carpenters—to be returned if not as represented.

We are also making a Centennial No. 8 Saw same style, selected handle and blade, five screws and closed back. A superior Saw in every respect. Finished 25 per cent. better than the regular No. 8, but at same price.

November, 1875.

The Winstead Hoe Co. have issued the following circular:

97 CHAMBERS AND 81 READE STS.,
NEW YORK, Nov. 8th, 1875.

GENTLEMEN: Since taking and filling many orders for our Winsted Toe Calks, we have had several complaints of their not being sufficient in temper, and in some cases lack of evenness and uniformity. To overcome both these complaints, we have not only improved our machinery, but are now using a higher grade of steel to secure better and more uniform goods, and to do this, our former prices fail to pay the cost. For such orders as we have accepted, the price will be as agreed, but, on further orders, we will be compelled to advance the price about 10 per cent. The only reason for our selling our Calks, of late, at a very low price, has been an unfair competition from other makers, who imitated ours by samples only, accepted orders at ruinous prices, and then failed to fill any part of them, finding that they were infringing on our process of manufacture (secured to us by three distinct patents), and, therefore, not being willing to take the responsibility of making them.

Respectfully, yours,
THE WINSTED HOE CO.,
HORACE DURRIE & CO., Sole Agents.

In another circular regarding the Winsted Toe Calks, they say: "These Calks commend themselves to all practical horse-shoers as being the original shape they are all familiar with, and at the same time effectually obviate the stereotyped complaints against the two-prong Calks in weakening the toe of the Shoe, where strength is most needed." They are warranted to harden.

Horace Durrie & Co. have also issued a circular, under date of 10th instant, informing the trade that they are now prepared to furnish Perkins' Hammered Snow Shoes. They are made in all sizes except No. 6, and are assorted the same as Horse Shoes.

E. E. Yates & Co., 103 Chambers street, have been appointed sole agents for the goods made by the Red Star Mfg. Co., of Johnstown, N. Y., who are now manufacturing an Improved Roller Saw Buck, a good substantial article, which they sell at $4 per dozen. Their advertisement will be found on page 17.

The Norwich Lock Mfg. Co., of Norwich, Conn., have issued, under date of 30th ultimo, the following descriptive price list of new goods not included in previous lists:

RABBETED MORTISE KNOB LATCHES.

For French Windows or Narrow Stile Doors.—5-16ths inch Spindle.

Lacquered Front, Japanned Case. Per doz.
No. 33, 2¼x2 in., Brass Bolt, Hub and Strike, Iron Front ..... $ 9·50
No. 34, 2¼x2 in., Brass Bolt, Front Hub and Strike ..... 16·00

MORTISE KNOB LOCKS.

With Steel Bow Spring.—5-16ths inch Spindle. Reversible, by taking off the Cap and turning over the Latch.

Lacquered Front, Japanned Cases and Escutcheons. Per doz.
No. 158½, 3½x3¼ in., 2 Brass Bolts, Iron Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler ..... $ 9·50
No. 170, 4x3¾ in., 2 Iron Bolts, Iron Front and Strike, Tinned Malleable Iron Key, 1 Tumbler, 12 changes ..... 6·50
No. 171, 4x3¾ in., 2 Iron Bolts, Iron Front and Strike, Brass Hub, Brass Key, 1 Tumbler, 12 changes ..... 8·00
No. 172, 4x3¾ in., 2 Brass Bolts, Iron Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 10·50
No. 173, 4x3¾ in., 2 Iron Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 11·50
No 174, 4x3½ in., 2 Brass Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 13·50

PATENT REVERSIBLE MORTISE KNOB LOCKS.

For Right or Left Hand Doors, with Steel Bow Spring.—5-16ths inch Spindle.

Lacquered Front, Japanned Cases and Escutcheons. Per doz.
No. 175¼, 4x3¼ in., 2 Iron Bolts, Iron Front, and Strike, Tinned Malleable Iron Key, 1 Tumbler, 12 changes ..... $7·00
No. 175¼, 4x3¼ in., 2 Iron Bolts, Iron Front and Strike, Brass Hub, Brass Key, 1 Tumbler, 12 changes ..... 8·50
No. 176¼, 4x3¼ in., 2 Iron Bolts, Iron Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 9·00
No. 177¼, 4x3¼ in., 2 Brass Bolts, Iron Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 11·00
No. 178¼, 4x3¼ in., 2 Iron Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 12·00
No. 179½, 4x3¼ in., 2 Brass Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 1 Tumbler, 24 changes ..... 14·00
No. 180¼, 4x3¼ in., 2 Brass Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 2 Tumblers, 24 changes ..... 17·00
No. 181¼, 4x3¼ in., 2 Brass Bolts, Brass Front and Strike, Brass Hub, Nickeled Key, 3 Tumblers, 24 changes ..... 20·00

JANUS FACE UPRIGHT RIM KNOB LOCKS,

With Steel Bow Spring. Reversible, by taking off Cover and turning over the Latch. 5-16ths inch Spindle.

Japanned Case and Escutcheons, Packed with Screws. Per doz.
No. 0540, 4x3¾ in., 3 Iron Bolts, Tinned Malleable Iron Key, 1 Tumbler ..... $6·75
No. 5403/4, 4x3¾ in., 2 Iron Bolts, with Stop on Latch, Tinned Malleable Iron Key, 1 Tumbler ..... 5·50
No. 0541, 4x3¾ in., 3 Iron Bolts, Brass Key, 1 Tumbler ..... 8·25
No. 5413/4, 4x3¾ in., 2 Iron Bolts, with Stop on Latch, Brass Key, 1 Tumbler ..... 7·00
No. 0542, 4x3¾ in., 3 Brass Bolts, Brass Key, 1 Tumbler ..... 11·50
No. 5423/4, 4x3¾ in., 2 Brass Bolts, Brass Key, 1 Tumbler ..... 8·75
No. 5423/4, 4x3¾ in., 2 Brass Bolts, with Stop on Latch, Brass Key, 1 Tumbler ..... 9·00
No. 0545, 4½x3½ in., 3 Iron Bolts, Tinned Malleable Iron Key, 1 Tumbler ..... 7·00
No. 0546, 4½x3¾ in., 3 Iron Bolts, Brass Key, 1 Tumbler ..... 8·50
No. 5463/4, 4½x3¾ in., 2 Brass Bolts, Brass Key, 1 Tumbler ..... 9·00
No. 0547, 4½x3¾ in., 3 Brass Bolts, Brass Key, 1 Tumbler ..... 11·25
No. 5483/4, 4½x3½ in., 2 Brass Bolts, with Stop on Latch, Brass Key, 1 Tumbler ..... 9·25

JANUS FACE PATENT REVERSIBLE UPRIGHT RIM KNOB LOCKS.

For Right or Left Hand Doors, with Steel Bow Spring.—5-16ths inch Spindle.

Japanned Cases and Escutcheons, Packed with Screws. Per doz.
No. 5605/4, 4½x3¾ in., 2 Iron Bolts, with Stop on Latch, Tinned Malleable Key, 1 Tumbler ..... $6·00
No. 5615/4, 4½x3½ in., 2 Iron Bolts, with Stop on Latch, Brass Hub, Brass Key, 1 Tumbler ..... 7·50
No. 5623/4, 4½x3¾ in., 2 Brass Bolts, with Stop on Latch, Brass Hub, Brass Key, 1 Tumbler ..... 9·50
No. 5675/4, 4½x3¾ in., 3 Brass Bolts, Brass Hub, Brass Key, 1 Tumbler ..... 12·25

JET KNOBS.

5-16ths inch Spindle. Per doz.
No. 1075, 2¼ in. in diam., Mortise, with Japn'd Mountings ..... $5·00
No. 1076, 2¼ in. in diam., Rim, with Japanned Mountings ..... 5·00
No. 1080, 2¼ in. in diam., Mortise, with Bronz'd Iron Mountings, Round Rose ..... 6·50
No. 1081, 2¼ in. in diam., Rim, with Bronzed Iron Mountings, Round Rose ..... 6·50
No. 1085, 2¼ in. in diam., Mortise, with Plated Mountings ..... 8·00
No. 1086, 2¼ in. in diam., Rim, with Plated Mountings ..... 8·00

We call the special attention of customers who prefer the so-called Lever Spring, to our New Patent Reversible Mortise and Rim Knob Locks, with Steel Bow Spring and Stationary Hub standing flush with the case of the Lock, believing it to be superior to any Steel or Lever Spring Lock in the market.

We also continue to furnish, in full line, our regular style of "Pull-Out Reverse" Mortise and Rim Knob Locks, already so well and favorably known. The working parts have been so improved and strengthened that we can confidently recommend it as unexcelled by any in simplicity and durability.

NORWICH LOCK MFG. COMPANY.

On the opposite page will be found the advertisement of Blake Bros. Hardware Co., hardware manufacturers, who offer their business for sale. For fifty years their goods have been known to probably every hardware merchant in the country. Mr. Blake, the remaining senior partner, and the heirs of the deceased members of the firm, deem it advisable, as we understand, to give up this branch of their business on account of that of their extensive stone-crushing machinery, which requires all their time and attention. Opportunities seldom occur where a business having the advantages of age and reputation such as this possesses, can be purchased on such favorable terms.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, NOV. 10, 1875.

Scotch Pig.—The market has been depressed since last report, but has now recovered a little, although prices are not very strong:

Gartsherrie No. 1	73/6
Coltness No. 1	78/
Glengarnock No. 1	70/
Eglinton No. 1	63/

Manufactured Iron.—The market is stronger.

Rails.—No change to report.

IRON.

American Pig.—There is nothing new to report in the condition of the Pig Iron market. There does not seem to be any increase of activity, and we believe the trade is entirely confined to sales to meet the current wants of consumers, without any disposition toward speculation. Indeed, we do not find any well-informed person who looks for better prices in the near future, and the majority are confidently predicting a decline. In everything except coal the cost of making Iron has been very largely reduced, in many respects almost as low as ever, and until the demand becomes very much larger than it has been for some time, the price cannot be much higher than the cost to the furnaces most favorably situated. In this market the transactions have been small. We note sales by the Thomas Iron Company of 400 tons No. 1 Foundry at $24, 400 tons No. 2 Foundry at $22, and 100 tons White and Mottled at $20. We quote Foundry No. 1, $24; Foundry No. 2, $22; Gray Forge, $20 @ $22.

Scotch Pig.—The sales of Scotch Iron during the week have been small, but the market is firm on account of the strength of the holders. We quote Coltness, $32·50 @ $33; Glengarnock, $32; Gartsherrie, $32·50; Eglinton, $29·50 @ $30.

Rails.—We hear of considerable negotiation, but no sales of Rails, except 3000 English, on private terms. We quote American, $45 @ $50, at mill, but the tendency of the market seems downward, and there is no doubt this price can be shaded. For Steel Rails the Eastern makers are asking $70, while in the West they can be had for $65. We hear of no sales.

Old Rails.—Although the stock of Old Rails is considerable, but few are offered at present prices, which are $25 @ $26. We note the sale of 2000 tons, f. o. b., at Portland, at $25, 4 months.

Scrap.—There is nothing to report, and prices remain as last week, $31 @ $32.

METALS.

Copper.—There has been more doing in futures in Lake Superior Copper, the amount changing hands therein for the week being something like 800,000 to 1,000,000 pounds, December to April delivery, at 23c. On the spot none but small lots have been done at the same figure. Since the future transactions came to pass, rather a steadier feeling has been noticeable for the moment, and nothing offers. There is still a lack of activity; at all events we have Copper enough to supply all our wants. No further telegrams have come to hand from London, hence there will have been no change. The feeling there is one of steadiness, in consequence of the light charters on the West Coast; business was not over brisk, and is likely to continue so for some time. Our own mines are doing well. Thus the Houghton *Mining Gazette* has the following passage: "As we predicted, the Calumet and Hecla product for October reached an enormous figure, having turned out over 1260 tons of mineral, a yield unprecedented even in its own magnificent record." The manufactures of Copper have been sustained as follows: New Sheathing, 30c.; Bolts and Braziers, 31c.; Nails, 38c. @ 39c.; Bronze and Yellow Metal Sheathing, 21c.; Yellow Metal Bolts, 28c.; and ditto Nails, 21c., net cash.

Tin.—The market has been very quiet. We quote Straits, in gold, large lots, 19⅝c.; English Refined, 19⅝c.; ditto Common, 19½c.; and Banca, 24c. The day before yesterday London wired: "Straits, £84; holders pressing sales." Singapore simultaneously cables $23·25 @ $23·12½ per picul for Malacca Tin. The Associated Press telegrams contain the following news from Penang (Malacca), one of the Tin shipping places: "The mutilated remains of Mr. Birch, the late English Resident at Perak, have been recovered after a sharp engagement with the Malayans. All this side of the Malay Peninsula is greatly excited. A general outbreak is feared. Troops are at Perak, and more have been telegraphed for from Hong Kong." Should the Tin mines, which are worked by Chinese, be in any way threatened, dispatches to the leading metal firms here would have been received ere this. In any event, the British government can probably soon bring a sufficient and superior force to operate in the revolted district. Meanwhile, it is not likely that work at the mines will be seriously interrupted. Singapore exported this year, from Jan. 1 to Sept. 17, to England, 25,894 piculs; to the United States, 32,591; to the Continent, 3731; Penang to England, to Sept. 6, 57,029. The total shipments from the Peninsula were, consequently, during the eight months and a half, 119,245 piculs, or 7133 tons. Should the disturbance be more serious in its consequences than is now apparent, it might place Tin in a position vastly different from the one it holds at present. Tin Plates have been remarkably quiet at the following quotations for large lots, in gold, per box, ordinary brands: Charcoal Bright, $7·37½ @ $7·50; ditto Ternes, $6·87½ @ $7; Coke Tin, $6·50, and ditto Ternes, $6·12½. In England, production is being decreased; the market there, per cable, is strong, and makers do not feel inclined to make contracts ahead for the sale of their product.

Lead.—Sales have amounted to but 75 tons. Domestic on the spot at 5·65c., gold, which is the current price. The ordinary run of Missouri Lead at St. Louis is worth but 6½c., currency, while Select commands 7⅛c., currency, out there. Holders of Spanish Lead in Europe have during the week been cabling offers to sell this way more frequently in consequence of the gradual yielding in those markets of something like 15/ per ton during the fortnight. As we have said on a former occasion, the great stimulus to the upward movement in Europe came from Russia, which country has transformed its small

arms most thoroughly on a vast scale, and altogether probably took some 15,000 tons till the close of navigation in all the present year. This demand has now ceased, and stocks in the west of Europe have a fair chance to accumulate, Spanish production going on uninterrupted. Manufactures of Lead are unchanged, and we quote Bar and Pipe, 8¾c., and Sheet, 9½c., less 10 per cent.

Spelter and Zinc.—The moderate demand for Domestic Spelter which is to be met with, is easily filled by outside lots at 7¼c., currency, cash, while the combination maintains its figure, 7·40c., currency, without effecting any sales to speak of. In Foreign nothing has been done, but some business seems to be on the point of being closed. We continue to quote 7·15c. @ 7·37½c., gold. Sheet Zinc is steady at 9c., gold.

Antimony.—The quotation of £59 is sustained at London, and we are moderately active here at 13¾c. @ 14c., gold, with a rapidly diminishing supply.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending Nov. 9, 1875:

Hardware.

Boker Hermann & Co.
Arms, cs., 9
Guns, cs., 4
Blumenthal I. & A.
Mdse. pkgs., 2
Casks, 1
Baldwin Bros. & Co.
Gun barrels, cs., 15
Elger Ernest & Co.
Wire, cks., 5
Folsom Chas.
Per. caps, cs., 4
Gun wads, cs., 3
Guns, cs., 2.
Field A. & Co.
Cases, 8
Casks, 7
Chains, cks., 52
Hildick A. H.
Chains, 2
Files, cks., 2
Bits, cks., 1
Hecht Bros.
Cases, 1
Lewis & Conger,
Casks, 3
Laughland & Co
Wire, bdls., 4
Netting, cs., 1
Lamarche H.
Nails, bbls., 50
Lau & Garlichs,
Guns, cs., 2
Lennox E. S. & Co.
Sale ties, lots, 597
Morgan J. L. & Co.
Wire rope, coils, 3
Moore's J. P. Sons,
Arms, cs., 12
Cartridges, cs., 7
Per. caps, cs., 6
Empty cartridge cs., cs., 11
Merchants' Dispatch Co.
Gun wads, cs., 4
Arms, cs., 9
Cases, 1
Noyes, White & Co.
Per. caps, cs., 4
Pearson & Co.
Wire, bdls., 213
Peters Bros.
Mdse. pkgs., 3
Remington E. & Sons,
Mdse. pkgs., 4
Robbins C. & Sons,
Wire rods, bdls, 120
Struller Louis,
Arms, cs., 6
United States Ordnance Department,
Packages, 66
Van Wart & McCoy,
Cases, 4
Wolfe S. N. & Co.
Iron ware, cks., 22
Ward A.
Mdse. pkgs., 1
Witte J. G. & Bro.
Guns, cs., 15
Wiebusch & Hilger Hwd. Co.
Wire, cks., 5
Gun caps, cs., 14
Mdse. pkgs., 5
Order.
Wire, cs., 22

Iron.

Laughland & Co.
Hay bands, bdls., 575
Marvel Wm. D.
Ore, tons, 220
Phelps, Dodge & Co.
Sheet, bdls., 184
Winchester Repeating Arms Co.
Bundles, 246
Order.
Rods, bdls., 150
Pig, tons, 200
Sheet, bxs., 38

Steel.

Brown, Shipley & Co.
Bars, 444
Jacobs, Strouse & Co.
Sheet, cks., 8
Robbins C. & Sons,
Cases, 1
Sulzbacher & Heyman,
Bundles, 10
Woodford W. O.
Cases, 25
Order.
Bundles, 688
Sheets, 1

Metals.

Burcey Chas.
Packages, 13
Bruce & Cook,
Tin plates, bxs., 500
Byrne Joseph & Co.
Tin plates, bxs., 278
Tin, slabs, 250
Tin, ingots, 600
Cort N. L. & Co.
Tin plates, bxs., 500
Canadian Bank of Commerce,
Tin plates, bxs., 500
Tin and terne plates, bxs., 775
Lamarche H.
Rolled zinc, cs., 18
Mott Haven Mills,
Copper, cakes, cs., 1
Naylor & Co.
Tin plates, bxs., 500
Terne plates, bxs., 390
Noel, Saurel & Marneffe,
Tin sheets, cs., 3
Phelps, Dodge & Co.
Tin plates, bxs., 2109
Order.
Tin plates, bxs., 2966
Tin, slabs, 1136
Terne plates, bxs., 604

COAL.

There is a moderate trade doing in Anthracite Coal for the season. The demand for domestic sizes is active and well maintained; for the larger sizes there is little if any improvement. The Bituminous Coal trade shows a considerable decrease in activity, owing to the scarcity of vessels and the advancement of freights.

The quantity of Coal sent from the Schuylkill region during the past week was, by rail, 133,706 tons; by canal, 30,722 tons; total, 164,428 tons, against 164,852 tons for the corresponding period of last year. Decrease, 424 tons. The quantity so far this year, 3,778,449 tons, against 3,599,972 tons for same period last year, decrease, 178,477 tons.

The quantity sent from all the regions for the week was: Anthracite, 635,658 tons; and 82,660 tons Bituminous; total, 718,318 tons, against 563,373 tons Anthracite, and 75,280 tons Bituminous; total, 643,653 tons for the corresponding week of last year. Increase of Anthracite, 67,285 tons; increase of Bituminous, 7380 tons. Total increase, 74,665 tons.

The quantity sent from all the regions so far this year is: Anthracite, 16,959,963 tons; Bituminous, 3,293,149 tons. Total, 20,253,112 tons, against 17,143,926 tons Anthracite, and 3,071,842 tons Bituminous; total, 20,215,768 tons. Decrease of Anthracite, 183,963 tons; increase of Bituminous, 222,307 tons.

The circular of Messrs. E. B. Ely & Co., Room 12, Trinity Building, 111 Broadway, quotes as follows for Coal delivered on board vessels at South Amboy, N. J., during the month of November:

	Beaver Meadow Lehigh.	Franklin.	Wilkesbarre.
Lump	$5·35	$5·05	$5·05
Steamer	—	5·15	5·15
Broken	5·55	5·25	5·25
Egg	5·65	5·65	5·65
Stove	6·10	6·10	6·10
Chest	5·10	4·95	4·95
Lehigh Washed Pea.	4·00, f. o. b.		

We quote as follows: Anthracite, $4·95 @ $5·10; Cumberland, $5·25 @ $5·75; West Virginia, $5·75 @ $8; James River Steam, $5·25; James River Carbonite, $9 @ $9·50; Kanawha House, $11·50; American Gas, $5·75 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $5·75; Murphy Run, $5·50; Newburgh Orrel, $5·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7; Scotch, $7·50 @ $8.

The Coal transported over the Cumberland Branch Railroad during the week ending Nov. 6, 1875, amounted to 4842 tons, as against 6497 tons shipped in the corresponding period of last year, showing a decrease of 1655 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 31,697 tons, against 41,783 tons shipped in 1874, a decrease of 10,086 tons. The aggregate amount of Cumberland Coal shipped by the various companies so far this year amounts to 2,002,889 tons.

OLD METALS, PAPER STOCK, &c.

Business in this market has improved considerably since last week, and a better feeling is apparent among dealers. There is an active demand for all grades of Rags, with the exception of White Linen, No. 1, and, as a rule, dealers have obtained full prices for their accumulations. Old Metals continue very dull, and are in but little request. We have nothing new to report in the way of changes in our market quotations. The following are the purchasing prices offered by dealers:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4¼c. @ 4½c.; Pewter, No, 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5¼c., Wrought Iron, 1c.; Sheet do., ¼c.; Cast, do., ⅛c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 4¾c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¼c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 2¾c.

PHILADELPHIA.

PHILADELPHIA, Nov. 9, 1875.

The market continues without change in prices or any material alteration in the amount of sales. It seems probable that trade will continue about as now, until the spring opening, when better prices and demand will, doubtless, prevail. The only feature of improvement noticeable is the demand from railway companies for rails for repairs, and cars, in both of which branches the inquiry is steady and improving. The difficulties with the puddlers at various local and near-by mills continue, and the suspension of these works is probably a good feature in the trade, as it prevents any accumulation of stocks. The various articles entering into the production of iron are all now at their minimum of cost, except coal, which, it is unlikely, will be obtained at any material reduction under these circumstances. Consumers cannot expect iron to be lower, and may make it higher by witholding orders, until the majority of the works are forced out of production. Relatively speaking, both Pig Iron and Rails are good property at present prices, and no doubt a portion of the purchases of the latter have been made with this view. As the car works resume operations, Bars and heavy sections of rolled Iron will appreciate slightly, but it is not probable will show any material advance before spring. Prices remain about as at our last, being occasionally shaded to effect sales, and are quotably as follows, viz:

PIG IRON.—No. 1 Foundry, $24 to $24·50; No. 2, $21 to $22; Gray Forge, $21 to $22; White and Mottled, $19 to $20.

BARS.—2·4c. to 2·6c. per lb.

RAILS.—$45 to $49.

OLD RAILS.—$25 50 to $26.

SCRAP.—$30 to $31.

We note sales of 2000 tons of No. 1 Foundry at $24·50; 1000 No. 2 at $22; 500 tons Gray Forge at $21 at furnace, and 300 tons at $20 at furnace; 3750 tons Rails for Western delivery at $50 at mill; 900 tons 60 lb. at $48 at mill, and 200 tons Steel on private terms, and 200 tons Light Rails at $47; 800 tons Old Rails at $25·50, here; 200 tons Wrought Scrap at $30, and 50 tons at $29. Also 400 tons choice Armor Plate Scrap at $33. A typographical error in last weeks' report made 25,000 tons of Rails sold to a local road, which should have been 2500 tons.

PITTSBURGH.

PITTSBURGH, Nov. 9, 1875.

PIG IRON.—The general position of the Pig Iron trade has varied but little, if any, since the date of my last report. Business continues exceedingly dull, and prices are weak and in buyers' favor, although holders, especially producers, appear to be confident that hard pan has been reached, that prices cannot possibly go any lower. However, this is a disputed point, and time alone will demonstrate its correctness, although it is well to bear in mind that there is no margin for profit at current rates, notwithstanding the cost of manufacture has been very largely reduced. Then again, the fact that stocks not only here, but at our main sources of supply, are down lower than they have been for several years, and a large percentage of the furnaces are out of blast, is having its effect in stiffening the views of holders. While some producers are refusing to accept less than $24 to $25, 4 mos., the mills have no difficulty in obtaining all the pig they want at $22, each, and $23, 4 mos. There has been considerable activity in Charcoal Irons recently, the most of which was purchased by stove manufacturers, who bought because it was offered at about the same price they were paying for good Coke Iron. The demand for all kinds of Iron, however, is confined mainly to supplying immediate wants, and with the exception of when inducements are held out in the way of low prices, as is sometimes the case by parties who are pressed for funds, the hand-to-mouth policy will, no doubt, be closely adhered to during the balance of the year.

MANUFACTURED IRON.—Trade is still reported dull and unsatisfactory by manufacturers, although the outlook, in some respects, is more encouraging. The puddlers, as stated in my last, have agreed to work at a reduction of 50 cents per ton, this month, and to be guided thereafter by the prices current East; in other words, the rates in Pittsburgh are to be the same as those paid the puddlers in Philadelphia and other points in the East. Then again the project to substitute gas in the place of coal for fuel promises to be a complete success. There are numerous advantages claimed for gas, one of the most prominent being that it is much cheaper than coal, and another equally as important is that it will make a better quality of iron. The gas, which is being brought from the gas wells in the Butler county oil region, has already been introduced in the mills of Graff, Bennett & Co. and Spang, Chalfant & Co., and is working very satisfactorily. This is a very important matter to Pittsburgh, as in addition to reducing the cost of production it will improve the quality, thereby giving her a very decided advantage over all competing points. At the present writing, however, business is very dull in all branches of the iron trade, and recent suspensions have darkened the outlook somewhat, which at best has not been very encouraging recently.

NAILS.—The demand is light and falling off, as it usually does at this particular time, and but very few of our manufactures are working up to their full capacity; prices are weak but unchanged, $2·85 to $2·90, 60 days, with two per cent. off for cash.

STEEL.—There is nothing particularly important to record; business continues to hold out pretty well, better, possibly, than we had reason to expect, but it is still complained that prices are unremunerative, that is for the ordinary grades, in which there is no active competition.

SCRAP IRON—Continues exceeding dull, with but little prospect of an early improvement, either in the demand or prices. Most of the Scrap in yards of dealers cost them from $1 to $3 per ton more than they could now obtain for it, even if there was a demand. No. 1 Wrought Railroad Scrap quoted nominally at $1·30 to $1·35, 4 mos., delivered.

COAL.—About 7,500,000 bushels were shipped to down river markets, mainly Cincinnati and Louisville, last week by river.

BOSTON.

NOV. 7.—*Pig* remains as last noted, wholly unsettled, with buyers dictating terms rather than holders suggesting values. The quotation on the fancy No. 1s does not run above $26, while two or three prominent lots have been offered at $25 at the close, with holders giving the refusal until Monday to take the situation into consideration. No. 2s quote at $24 to $25, and Gray Forge $20 to $23, with no buyers. The primary markets are still unsettled, brokers quoting $24 to $27 for No. 1, $22 to $26 for No. 2 and $20 to $23 for Gray Forge. *Bar* has had a quiet week, with prices just about as irregular as a week ago, running from $55·50 to $57·50 on warranted Refined, just according to the whim of seller or acuteness of buyer. The advance of 5c. per hundred on Western freight, now quoting 30c., has had a trifling influence to stay any further downward movement, although the market is not firm. *Steel* is moving along in a small way, this week showing a recall for Sleigh Shoes and Machinery. Prices are a trifle steadier. We quote: American Tool, 14c. to 15c.; American Machinery, 9c. to 9½c.; Bessemer Tires, 7c. to 7½c.; Sweet's Excelsior Tire, 8½c. to 12c.; English Tool, 16c. to 18c., gold. *Copper* remains without improvement. The reports from foreign markets show a full stock and small demand, while hereabouts brass founders, copper workers and the Copper manufacturing companies never were doing less. The market shows no noticeable strength on Ingot, which is quoting at 23c. For manufactures we quote: New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 29c. to 29c. *Lead* is very dull, and prices seem to hold nominally at last quotations. We quote Pig, 5¾c. to 5¾c. for Domestic, and 6¾c. to 6¼c. for Foreign; Sheet and Pipe Lead, 9c., currency; Tin Lined Pipe, 16½c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Antimony* is firm, with a small inquiry at 13½c. *Spelter* is strong and quiet at $7·45, 30 days, and $7·35, prompt cash, all currency. Silesian is having a trivial business at $7·30. *Tin* has had a small jobbing business at somewhat irregular prices, our quotations representing the full measure of holders' expectations. We quote: Straits, 19¾c.; Banca, 24c.; Refined English, 19¾c. to 20c., gold. Plates are active; we quote Charcoal I. C., $7·25 to $7·75; Coke, $6·50 to $6·75; and Terne at $6·15 to $6·50, gold.—*Com. Bulletin.*

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of Nov. 5, report the Iron market as follows: Our market the past week has been moderately active. Prices, however, are growing weaker, with but little hope for any change for sometime to come. We quote as follows, on 4 months' time:

Mo. Stone Coal,	No. 1 F'dry.	$26·50 @ 27·00	—4 mos.
" "	No. 2 F'dry.	24·00 @ 25·00	—4 mos.
" "	Gray Mill	23·50 @ 24·00	—4 mos.
" Charcoal,	No. 1 F'dry	26·00 @ 27·00	—4 mos.
" "	No. 2 F'dry	23·50 @ 24·00	—4 mos.
" "	Gray Mill	23·00 @ 24·00	—4 mos.
Tenn. Charcoal	No. 1 F'dry.	25·00 @ 26·00	—4 mos.
" "	No. 2 F'dry	24·00 @ 24·00	—4 mos.
" "	Gray Mill	22·00 @ 23·00	—4 mos.
" Coke Iron	No. 1 F'dry.	25·00 @ 26·00	—4 mos.
" "	No. 2 F'dry.	23·00 @ 24·00	—4 mos.
" "	Gray Mill	23·00 @ 24·00	—4 mos.
H. R. Charcoal	No. 1 F'dry.	26·00 @ 27·00	—4 mos.
H. R. "	No. 2 F'dry.	24·00 @ 25·00	—4 mos.
H. R. "	Gray Mill	24·00 @ 25·00	—4 mos.
Massillon Iron,	A, No. 1	24·00 @ 25·00	—4 mos.
" "	B, No. 1	32·00 @ 33·00	—4 mos.
" "	No. 2	30·00 @ 31·00	—4 mos.
Cold Blast Car Wheel,	Mo.	32·00 @ 35·00	—4 mos.
" "	Tenn.	30·00 @ 32·00	—4 mos.
" "	Ala.	30·00 @ 32·00	—4 mos.
" "	Hanging Rock	35·00 @ 40·00	—4 mos.
Mo. Charcoal Blooms		60·00 @ 65·00	—4 mos.
" Scrap "		60·00 @ 65·00	—4 mos.
Mo. Charcoal Hammered Billets		80·00 @ 90·00	—4 mos.
Assorted Bar Iron		2 4-10 rate.	
No. 1 Wrought Scrap		1c.	per lb.
Heavy Cast "		¾c.	"
Light Cast "		½c.	"

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Nov. 9: Business continues ruling dull and stagnant, and each succeeding week seems more so than its predecessor. In the absence of trade we quote the market depressed, with list nominally unchanged:

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick..	2 5-10 to 2 6-10c. ₩ lb.
1 to 4½ wide by 1½ to 2 thick	
Round and square, ordinary sizes, from ⅜ to 2 inclusive	2 5-10 to 2 6-10c. "
Hoop Iron, 1½ wide and upward	3¾ to 4c. "
Band Iron, from 1¼ to 4 in. wide	3 to 3¼c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick	3½ to 4c. "
Norway Nail Rods	7 to 7¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15½ to 16c. "
Machinery Steel	11 to 11½c. "
Cast Spring Steel	10 to 10½c. "
Homogeneous Steel Plate	10½c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·12½
" Mule Shoes " "	6·12½

Common Horse Nails, from 14c. to 18c per pound.

Putnam Horse Nails	10	9	8	7	6	
	23	24	25	26	28c.	per lb.
Globe Horse Nails	10	9	8	7	6	
	23	24	25	26	28c.	per lb.

R. R. Spikes.....5¼ by 9-16 at 2 9-10c to 3c. per lb.

Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, Nos. 23 and 25 South Frederick street, report the Pig Iron market as follows, under date of Nov. 9: There has been no change in the general tone of the Iron market. Iron continues dull and depressed, with small sales. We quote:

Baltimore Charcoal	$32·00 @ 35·00
Virginia "	30·00 @ 34·00
Anthracite No. 1	24·00 @ 26·00
" No. 2	23·00 @ 24·00
" No. 3	21·00 @ 22·00
White and Mottled	18·00 @ 19·00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of Nov. 8: Receipts of Charcoal Irons continue light. The demand is not active. Sales of about 300 tons at quotations.

Virginia cold blast Charcoal Pig Irons		$30·00 @ 35·00
" hot " " "		28·00 @ 32·00
Va. hot blast Coke Pig Iron,	No. 1 ex.	26·00 @ 27·00
" " " "	No. 2 ex.	25·00 @ 26·00
" " " "	No. 3 ex.	24·00 @ 25·00
Virginia Anthracite.	No. 1 ex	27·00 @ 28·00
" "	No. 2 ex	26·00 @ 27·00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels).

PARIS, Oct. 24, 1875.—*Metals.*—There has been no change of note during the week in the European Metal markets. The demand is not brisk, yet values are tolerably well sustained, no pressure being shown to realize, notwithstanding the rather disturbed condition of the money market. Although the Metal markets have thus shown considerable strength, it is questionable whether they would be able to withstand a still further screwing up of the discount rate, should such be deemed necessary at London in consequence of an increased drain of gold. At all events, the financial situation in Europe is far from being a reassuring one. So many firms of note have gone by the board at London and on the Continent since spring, the losses sustained by holders of Turkish securities have been so severe, that the end of financial troubles does not yet seem to be at hand, especially in view of the Eastern question, which threatens to loom up again in some unexpected formidable shape, instead of being speedily settled, as we had reason to hope but a short time ago. However satisfactory the deliveries of Metals may have been hitherto, and however solid their statistical position may seem, there are so many outside eventualities possible that it would seem hazardous to indulge in sanguine hopes of a return to former high prices. *Copper* has nevertheless kept steady, and at a time even improved a fraction, in response to the light charters on the West Coast, of but 1400 tons during the first half of October. But the Board of Trade returns in England are not favorable. While the import had been 59,625 tons during nine months, against 54,980 last year, there had been exported but 38,318, against 45,278. The market here has been weak, and we quote, deliverable at Havre, Chili Bars, 218·75; Common ditto, 212·50; Ingots, 222·50; English Tough Cake, 225; and pure Corocoro Ore, 217·50. Manufactures are in good request. Marseilles is quiescent. Steadiness has been the characteristic of the *Tin* markets; Australian is gaining in popularity, now that a better quality is shipped from there. Here hardly anything has been done, but prices are sustained at 237·50 francs for Banca, at Havre or here; Straits, 227·50, and English, at Havre or Rouen, 225. Tin is firm at Marseilles at 215 for Straits and Billiton, at which parity the Batavia sale went. *Lead.*—The firm attitude which this metal had maintained throughout the summer months has been very much impaired of late, now that affairs in Spain are returning to a normal condition and Russia takes no more. There has been no decline here, although the dealings have shrunk to a minimum. We quote French here, 58·50; Spanish and English, at Havre, 58. Marseilles has formed an exception from the remaining markets, and is firmer once more at 54. *Spelter.*—Activity in this metal has again become stimulated by a more pressing demand pretty much everywhere, Paris excepted, where we have but few transactions to note, and no change, while Sheet Zinc remains scarce and firm at 85. *Iron.*—Little change has occurred during the week. Pig Iron has shown greater firmness, and, considering the low price to which Scrap and Merchants' Iron has declined, we look upon this as a favorable sign. Old Rails command 105 francs, Pig is worth 58 at Luxembourg, and 68 at Nancy; a speedy advance of a couple of francs would not surprise us. In *Coal* we do not look forward to any very great improvement in the immediate future; half greasy Lump Coal now commands 30 francs; small Lump, 18, and Dust Mixed, 14 to 16. Here Select Lump, for parlor use, is worth 60 francs. These prices, moderate as they are, are yet remunerative enough to the producer, and although prosperity is great in our country at present, the revival in business which seems to impend might still be seriously hampered, if Coal suddenly improved considerably.

BELGIUM.

(Revue Universelle).

BRUSSELS, October 24, 1875.—*Iron.*—Iron industry, whichever way we may look, has evidently received a check not easily explained. Within the memory of man the production of Pig Iron has not been as unprofitable as it has proved to be during the past two years. Our iron masters, in order to find, if possible, a solution for this enigma, and a remedy, are again seriously bent upon bringing about some saving, be the same in the consumption or cheapening of fuel, in wages or transportation, but we fear much that an efficient remedy will be found lacking, where consumption has eviden ly been greatly diminished everywhere. Nor have the efforts which they have made for the purpose of widening the sphere of our export abroad met with the degree of success which had been hoped for, due probably to some mistaken notions as regards the real wants of foreign nations. It is all the more to be regretted, consequently, that with but a few exceptions of men of superior intelligence, the bulk of Belgian iron masters will be unrepresented at the Centennial Exhibition at Philadelphia, next May. A splendid opportunity would have been offered to them there, to show to thousands of customers from all the habitable quarters of the globe what Belgium and Belgian iron industry really are, and most erroneous notions about our country and its productions would have been removed. The question which naturally suggests itself is, whether or not the partial paralyzation of Iron industry is due to the metal being gradually superseded by Steel, and whether in reality the reign of Iron is seriously menaced in its vital parts. *Coal* is doing well in Belgium, to a certain extent, even for industrial purposes, but more especially for domestic consumption. Some mines have increased their capacities of output; others still hesitate.

GERMANY.

(Borsenhalle).

HAMBURG, Oct. 23, 1875.—*Metals.*—The German markets have on the whole remained quiet, at least so far as *Copper* and *Tin* are concerned, in both of which nothing has transpired, our metal trade preferring to remain in an expectant attitude, while the money market at London and elsewhere has again become agitated and tighter. *Lead* has slightly given way in consequence of the advanced season, when consumption usually diminishes. At Cologne the quotation is 22·25 to 22·50 marks the 50 kilos; Spanish, at Stettin, is 27, and German, 23 to 25, according to brand. There is nothing doing here; some lots of Spanish have passed in transit to the interior. We quote: German, 23·75 to 24·50; English, 25·50 to 26, and Spanish, 26·10 marks. *Spelter.*—High prices of this metal are fully upheld in this country. The works have sold all they can produce this year, and in the meantime the stock is concentrated in dealers hands. While this is the case, there is a steady demand for England, where stocks have been reduced to a mere trifle. In consequence of this good position of the metal, it sells without difficulty at Cologne at 24·50 to 25, at the works. At Breslau the same firmness is noticeable, special brands bringing 24, and common, 23 to 75 marks. The tendency at Stettin remains upward at 25·26. Nothing transpires in our own midst. In former years our port used to be the principal market for Spelter, partly on account of the advances made to the mines from here; but latterly Spelter is more largely distributed from the places of production direct to the consuming centers. From being a quiet, sluggish article, Spelter has become active and popular, owing to its comparative cheapness and easy adaptability to many uses.

HOLLAND.

(Koch & Vlierboom).

ROTTERDAM, Oct. 19, 1875.—*Tin.*—The market is quiet. Banca from the November sale impending has been done at 53, and Billiton landing at 50¾ guilders. Oct. 26.—The quiet state of affairs continues; Banca deliverable from the next auction has sold at 52⅜, and spot Billiton at 50¾.

EAST INDIES.

(Aitken, Spence & Co.)

COLOMBO (Ceylon), Oct. 2, 1875.—*Plumbago.*—We have nothing fresh to advise. The attention of the government has been repeatedly called to the falling off of exports this year, in comparison with recent years, and the abolition or, at least, reduction of the heavy export duty has been solicited without any success, or probability of success at present, which is much to be regretted. *Shipping.*—The British Constitution arrived from Galle a few days ago and has commenced loading. Stormy weather, usual about this time of the year, interferes very much with shipping operations. We have just heard of the fixture, at Galle, of the Soteria, 598 tons, to load *via* Colombo and Alleppy for New York. She may be expected to arrive here in the course of a fortnight. We quote lump, cleaned, including packages per ton and duty, free on board, without freight, exchange at par, 320/; Chip, 180/; and Dust, 120/. There have been shipped, during the year ending yesterday, to the United States, 29,893 cwts., against 37,668 last year; to England, 59,182; to the Continent, 1448; to India, 21; and to Australia, 97; together, 90,641 cwts. Exchange unaltered at 1/10⅝ to 1/10¾.

Gilfillan, Wood & Co.

SINGAPORE, Sept. 17, 1875.—*Tin.*—Supplies have been moderate, and the bulk of the business has been for the United States. Last week's supply of Malacca sold at $22·32½ per picul, and this week's at $22·37½ per picul. For a special chop $22·50 per picul was paid. We look for pretty large shipments to the United States by steamer this month. *Tonnage.*—There are no disengaged vessels in harbor, and were it not that a number of steamers are expected from China to fill up for London, berth rates to the United Kingdom would advance. For New York the Kate Carnie is not yet full. For Boston the Nehemiah Gibson is loading. Nothing further has been heard from China regarding the Orestes, and it is thought she has been withdrawn from the New York berth. The Galley of Lorne will be here shortly, but her agents cannot engage cargo yet. The Glenartney, now in China loading for New York, will call here for Tin, but no engagements have been made as yet. The following Tin shipments have been made for New York: Per Tom Morton, via London, 69 piculs; per Menelaus, ditto, 346; and per Crocus, 564. *Exchange* has advanced to 4/1¾ to 4/1¾, 6 months, London. Tin shipments to England thus far this year, 25,894 piculs; to the United States, 32,591; and to the Continent, 3731; from Penang to England, 57,029, against 16,523, 36,222, 44,733, 38,920 and 19,226 in 1874–1870.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., Oct. 27, 1875.

TERRIBLE FLOODS.

For the past week or so we have thought and talked of nothing but the floods which have laid waste our towns, villages and river-side country during that period. The origin of the overflows was a persistent, relentless downfall of rain for about fifty hours—which came from the clouds in one continuous succession of cascades, and deluged the whole surface of the country. The brooks, riverlets and rivers speedily became surcharged, and rapidly either burst their banks or spread over the surrounding country in devastating inundations. In the towns—and notably in the place whence this communication is written—the river-side houses, and even properties half a mile away from the streams proper, were flooded in their lower stories, to the great damage of furniture and buildings, to say nothing of prejudice to health. Many of the steel and iron works were invaded by the surging tide of waters, not a little damage and inconvenience being sustained. At Messrs. Wm. Jessop & Sons large Brightside steel works the flood overspread the place to the depth of between one and two feet, filled the melting holes, ran amongst the raw materials, and, to crown all, rushed into one of the melting furnaces and caused it to explode. A large section of the wall of Messrs. Jessop's timber stores was also washed down by the current of the Don. At the Phœnix Bessemer Steel Works, near Sheffield, the men were trying to pour out a last "blow" of about six tons of material when the floods gained upon them suddenly, and there also caused an explosion which shook the whole neighborhood, but fortunately did not injure any of the men seriously. Many of the South Yorkshire collieries were flooded in the workings or rendered inaccessible on the surface. In all parts of the country the railway lines have been washed away, and even at this time many sections are several feet under water.

A CURIOUS STRIKE.

The miners of North Wales have to-day gone out on strike under circumstances which are probably unique. Their employers some time ago notified a drop in wages, which the men at first flatly refused to entertain, but afterward modified their opinions, and agreed that the matter should be referred to arbitration. Mr. Serjeant Wheeler, a well known legal gentleman, who was selected as arbitrator, gave his award in favor of the men accepting a reduction of 15 per cent. The miners, apparently thunderstruck at the idea, promptly rejected the award, hurled arbitration aside, and, as a counter move, sent in a demand for an advance of 20 per cent.! This, of course, the employers could not by any possibility entertain, so that matters came to a dead-lock and a strike has resulted. Mr. Serjeant Wheeler has, however, addressed a letter to the men, stating the grounds upon which he based his award, and pointing out the foolishness of rejecting the fiat of the very tribunal they themselves selected. There is some reason for supposing that this peculiar strike will not be of very long duration.

SELLING PRICES OF IRON.

The accountant, Mr. Waterhouse, appointed by the Northern Iron Trade Arbitration Board, has just finished his periodical returns showing the sales of manufactured iron in that district during the last three months, together with the average price as shown by his official inspection and analysis of the employer's books. The return is up to August 31st, the net selling price certified to be £7. 16/3 per ton. The details are interesting, and are consequently appended:

SALES DURING THE THREE MONTHS ENDING AUGUST 31ST, 1875.

	Weights invoiced. Tons.	cwt.	qr.	lb.	Percentage of total.	Average net price per ton. £	s.	d.
Rails	78,129	13	3	24	49·91	9	9	7·82
Plates	42,309	11	2	5	27·03	8	15	0·86
Bars	26,875	13	2	26	17·15	8	6	10·10
Angles	9,256	17	0	13	5·91	8	2	9·63
	156,553	16	1	12	100·1	7	16	3·03

This shows a considerable reduction on the price of iron as compared with former quarters of this year.

SCOTCH PIG IRON.

The Glasgow pig iron market was quiet, and at times dull during last week, warrants being tolerably even at 60/6 to 61/6 per ton. Thursday being a general holiday the market was closed. As will be apparent from the appended

quotations, all brands of makers' iron have become cheaper, although there was a respectable amount of shipping business transacted in the five working days of last week. On Friday night there were 73,137 tons in Connal & Co.'s stores, a decrease for the week of 1048 tons. The number of furnaces in blast in Scotland is still 116, and trans atlantic freights are unchanged on the low basis of 2/6 from Glasgow to New York. Ballast pig unaltered at 50/ per ton, alongside. Should the drain from Connal's stores become considerable during the next few weeks, it is very probable that prices will again be sent up by the speculators, as there appears to be no probability of the legitimate demand having any such effect.

Writing on October 23, Messrs. James Watson & Co. said: "We have to report a quiet market for Scotch pig iron this week, with business transacted in warrants from 61/ to 60/6, cash, closing buyers 60/6, sellers 60/9. Shipments last week were 9723 tons, against 10,140 tons in the corresponding week of 1874."

	No. 1.	No. 3.
G. M. B., at Glasgow	63/6	62/
Gartsherrie, "	71/	63/6
Coltness, "	75/6	65/6
Summerlee, "	68/	63/6
Langloan, "	74/6	64/6
Carnbroe, "	66/6	63/6
Calder, at Port Dundas	74/	63/6
Glengarnock, at Ardrossan	69/	64/
Eglinton, "	64/	63/
Dalmellington, "	64/	63/
Shotts, at Leith	74/6	65/6
Kinneil at Boness	64/6	61/6

Messrs. Wm. Colvin & Co. (Glasgow), Oct. 26th, say: "The warrant market has been quiet and steady during the past week, with a good deal of business doing between 61/ and 60/6. To-day the opening price was 60/6, from which it receded and touched 60/, but speedily improved again to 60/3, closing with buyers at that price for prompt cash, and sellers at 60/6, one month. The undernoted quotations show a slight reduction in the value of makers' iron, excepting the choice brands, which are firmer.'

	Deliverable alongside. No. 1.	No. 3.
G. M. B., at Glasgow	62/	60/6
Gartsherrie "	72/	63/
Coltness, "	77/	65/6
Summerlee, "	67/6	62/6
Langloan, "	74/	65/
Carnbroe, "	66/	62/6
Monkland "	62/	60/6
Clyde "	62/6	61/6
Goven, at Broomielaw	62/6	61/6
Calder, at Port Dundas	75/	63/
Glengarnock, at Ardrossan	69/	65/
Eglinton, "	63/	62/
Dalmellington, "	63/6	62/6
Carron, at Grangemouth	62/6	..
Carron, " specially selected	67/6	..
Shotts, at Leith	74/	62/
Kinneil, at Bo'ness	64/	61/
Bar Iron	£8. 0/ to £8. 10/	
Nail Rods	£9. 0/.	

SHIPMENTS.

	Tons.
Week ending Oct. 24, 1874	10,324
" Oct. 23, 1875	8,108
Decrease	2,216
Total Increase for 1875	86,466

Messrs. John E. Swan & Brother's (Limited), prices current, Oct. 23, says:

Glasgow Brands.	Furnaces Blowing, 116	Furnaces Out 30.	Furnaces Built, 154.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	70/	63/	..
Coltness	12	0	12	75/	65/	..
Summerlee	6	1	8	67 6	62/	64/
Langloan	7	0	8	75/	64/	..
Govan	4	0	5	63/	61/	64/
Calder	3	1	7	*75/	63/	65/
Shotts (Bess'mer)	2	0	2	80/	..	..
Shotts (Ordinary)	3	1	4	74/	65/	..
Carnbroe	4	2	6	66/	62/6	64/
Wishaw	2	0	3	..	..	..
Monkland	6	0	6	63/	61/	..
Chapelhall	3	0	3	70/	..	..
Clyde	5	0	6	63/6	61/6	..
Quarter-Clyde	4	0	4	63/	61/	..

* f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 60/6.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock		7	2	9	68/6	63/6	63/6
Ardeer		4	1	5			
Eglinton	Brand'd	6	2	8			
Lugar	Brand'd	4	0	4	63/	62/	63/
Muirkirk	Eglint'n	3	0	3			
Portland	Eglint'n	3	3	6			
Dalmellington		6	2	8	63/	62/	59/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil	3	1	4	64/	61/	60/
Almond	2	1	3	65/	61/	60/
Carron (Select'd)	4	2	6	67/6	..	..
Carron (Ordn'y)				65/	..	..
Lochgelly	0	4	4	..	..	..
Lumphinnans	0	2	2	..	..	..
Bridgeness	0	2	2	..	..	..

BRITISH RAILWAY STATISTICS.

The general report of Captain Tyler, government inspector, upon the railways of the United Kingdom for the year 1874, has just been issued, and contains an array of figures of more than customary interest. The following is a general summary of the report and statistics:

On the 31st December last 16,449 miles of railway were open for passenger traffic, of which 8749 miles were laid with two or more lines, and 7700 miles with single lines of rails. In England there were 11,662 miles, in Scotland 2700, and in Ireland 2127. The total capital raised by shares, stocks and loans, amounted to £552,661,551. The average expenditure per mile open, which was £34,099 at the end of 1858, had increased to £37,078 at the end of 1874. Whilst the increase in ordinary shares for the year 1871 over the year 1870 was rather under a million, or only 42 per cent., the increase for the year 1874 was rather over four millions—namely, from £244,449,805 to £248,528,241, or 1·67 per cent., the increase in guaranteed and preference stocks or shares was from £173,051,875 at the end of 1871, to £200,930,629, or 6·8 per cent., at the end of 1874. The increase also in loans and debenture stocks was from £149,378,080 in 1871 to £160,437,061, or 3·01 per cent. in 1874. But the debenture stock increased at the rate of 28 per cent. in 1872, 16 per cent. in 1873, and 1¼ per cent. in 1874, whilst the terminable loans decreased at the rate of 19 per cent. in 1872, 16 per cent. in 1873, and 12 per cent. in 1874. The process of converting terminable debentures into debenture stock, which was some years since proved to be so necessary, has thus been further continued. During 1874 no interest was paid upon £7,418,349 of preference stock. The holders of £8000 of loans and of £514,674 of debenture stock were also without interest in 1874. No interest was paid upon £43,711,506 of ordinary stock in 1874, which was a falling off as compared with 1873. The average rate of interest paid on ordinary capital in 1874 was 4·49 per cent. against 4·99 per cent. for 1873, 5·14 per cent. for 1872, and 5·17 per cent. for 1871, whilst on guaranteed preferential and loan capital the average interest paid was 4·41 per cent. for 1874, against 4·39 per cent. for each of the years 1873 and 1872, 4·42 per cent. for 1871, and 4·48 per cent. for 1870. The average interest on debenture loans decreased from 4·37 per cent. in 1870 to 4·25 per cent. in 1871, and to 4·19 per cent. in 1872, but increased to 4·21 per cent. in 1873, and to 4·32 per cent. in 1874; and that on debenture stock decreased from 4·47 per cent. in 1870 to 4·37 per cent. in 1871, to 4·34 per cent. in 1872 to 4·33 per cent. in 1873, and to 4·20 per cent. in 1874. The 4·54 per cent. of interest paid on £158,692,084 of guaranteed and preference stock in 1870 decreased continuously to 4·51 per cent on £173,049,413 in 1871 to 4·49 per cent. on £177,764,674 for 1872, and to 4·48 per cent. on £188,127,069 for 1873, but slightly recovered to 4·52 per cent. on £200,930,629 in 1874.

The average interest paid on the total capital increased from 3·75 per cent. for 1858 to 4·19 per cent. for 1870 to 4·43 per cent. for 1871, and to 4·51 per cent. for 1872, but decreased to 4·35 per cent. for 1873 and to 4·14 per cent. for 1874, whilst the average interest on preferential and loan capital taken together decreased from 4·63 per cent. for 1858 to 4·48 per cent. for 1870, to 4·42 per cent. for 1871, and to 4·39 per cent. both for 1872 and 1873; but improved to 4·41 per cent. for 1874. Whilst the increase in ordinary shares for the year 1871 over the year 1870 was rather under a million, or only 42 per cent, the increase for the year 1874 was rather over four millions, viz., from £244,449,805 to £248,528,241, or 1·67 per cent. The increase in guaranteed and preference stocks or shares was from £173,051,875 at the end of 1871 to £200,930,629, or 6·8 per cent. at the end of 1874. The increase also in loans to £160,437,061, or 3·11 per cent. in 1874. But the debenture stock increased at the rate of 28 per cent. in 1874.

The total receipts from railway working amounted to £56,899,498 on 16,439 miles for 1874, against £55,674,421 on 16,082 miles for 1873, against £51,304,114 on 15,814 miles for 1872, and against £47,107,558 on the supposed 15,376 miles (which may more properly be stated as 15,611 miles) for 1871; whilst the total expenses of railway working were £31,647,517 for 1874, against £30,060,112 for 1873, against £25,652,753 for 1872, and against £22,632,046 for 1871. The proportion of working expenses to gross receipts was, therefore, 55·6 per cent. for 1874, against 54·0 per cent. for 1873, against 50·0 per cent for 1872, and against 48·4 per cent. for 1871; and the percentage of net receipts to total capital decreased, as already explained, from 4·43 for 1871 and 4·51 for 1872, to 4·35 for 1873 and to 4·14 for 1874.

The total receipts from passenger trains increased from £20,622,580 for 1871 to £22,287,555 for 1872, to £23,853,892 for 1873, and to £24,893,615 for 1874; whilst the total receipts from goods trains increased from £26,484,978 for 1871 to £29,016,559 for 1872, to £31,821,529 for 1873, and to £32,005,883 in 1874; whilst the receipts from first class passengers increased from £3,948,812 in 1870 to £4,148,108 in 1871, to £4,319,185 in 1872, to £4,373,274 in 1873, and to £4,499,351 in 1874; and whilst those for second-class passengers increased from £4,925,542 in 1870 to £5,167,535 in 1871, decreased to £4,193,201 for 1872, and to £3,984,718 for 1873, and slightly increased to £4,099,181 in 1874, it is noticeable that those from third-class passengers increased from £7,473,727 in 1870 to £8,115,304 in 1871, to £10,318,761 in 1872, to £11,750,588 in 1873, and to £12,446,605 in 1874. The total amounts paid for personal injury were in 1870 £322,500, in 1871 £312,334, in 1872 £299,389, in 1873 £364,509, in 1874 £355,876; and there was paid for damage to goods, &c., in 1870 £123,931, in 1871 £141,288, in 1872 £186,619, in 1873 £231,707, and in 1874 £251,293.

THE DARLASTON STEEL AND IRON COMPANY.

At the annual meeting of this company, last week, the directors' report and statement of accounts showed that the gross profits of the past year amounted to £10,648. 2/2. Against this there were general charges to the amount of £8233. 17/8, and interest on debentures and loans amounting to £3344. 9/3, in addition to £2039. 13/4 as three months' interest on consolidated debentures. The result is, of course, a debit to the profit and loss accounts. Very few concerns are making any profit at present.

TRADES OF SHEFFIELD.

Trade still rules quiet in almost every department, and is almost certain to continue so during the whole of the now rapidly approaching winter. In the manufactured iron branches the commissions now in course of being executed are of small proportions, and there are but few firms which can look ahead for a month or so with any amount of confidence. Pig iron of ordinary qualities is a little easier this week, in consequence of the reductions which have taken effect in the Scotch and Cleveland markets. Local quotations are irregular, owing to the limited demand, and the existing uncertainty as to the immediate future. Hematite pig irons are weak at the following nominal quotations, it being reported that large orders can be placed at fully 2/6 under these figures: Maryport "hematite," No. 3, 70/; No. 4, 70/; No. 5, mottled and white, 70/; "Bessemer," No. 1, 77/6; No. 2, 75/; and No. 3, 75/; Millom "Bessemer," No. 1, 80/; No. 2, 77/6; and No. 3, 75/; "ordinary," 75/; No. 4, 74/; No. 5, 75/; mottled, 80/; and white, 75/; all on the usual four months' terms. There is a tolerably good production of Bessemer steel for various purposes at prices which range from £7 to £15 or £16, according to the labor, &c., bestowed upon it. It is in many respects fast superseding common cast steel, being very much cheaper, and for numerous purposes quite as reliable as the cast article. The rail mills, nevertheless, are still far from being well employed, taking them as a whole. Some few establishments are producing steel rails pretty freely, but it is understood that the orders have been taken at figures which leave but the slightest margin of profit. Some of the steel rail manufacturers assert that it is impossible under the present conditions to turn out thoroughly good and reliable Bessemer rails at less than £12 per ton, yet it is currently reported that orders are being accepted and executed at £2. 10/, or at any rate £2 under that price.

The annual report of the directors of the Albion Steel and Wire Company, Limited, Sheffield, again shows a loss, this time of about £14,000, on the year's working, making a total loss of something like £70,000 in four years', or thereabouts, operations. The directors account for the deficiency by the depressed condition of trade, the loss upon stock and loose tools of a branch establishment, the decreased value of stock on hand, a large bad debt, the extra provision which it has been necessary to make on the New York debts, together with the loss on American trading consequent upon a heavy agreement with the agent out there, and the almost stagnant condition of trade and the excessive permanent charges. This company has been an unfortunate one from its very commencement, although floated with the strongest recommendations, and a guaranteed dividend of 12½ per cent. for five years.

The half yearly meeting of the shareholders of the Sheffield United Gas Light Company was held on Monday. It was stated that the amount paid for coal during the six months was £2848 less than was paid during the corresponding half year of 1874, but the coke sold had realized £3408 less. There had been about £8000 spent on capital account in the half year, and a contract had been let for a new gasholder upon an entirely new principle, which had been adopted with great satisfaction by the Metropolitan Gas Company, London.

A petition for liquidation has this week been filed in the Sheffield Bankruptcy Court by or on behalf of Mr. George Wright, engineer and machinist, Perseverance Works, Masborough, near Sheffield. His liabilities are set down at £8840, with assets of the estimated value of £1000. On Tuesday the creditors of Messrs. Marsden & Stoker, iron and steel merchants, met at Sheffield, Mr. Joseph Garside presiding. The liabilities were shown to be over £5000. Liquidation was resolved upon, Mr. Kidd, secretary of the Charlton Iron Company, being appointed trustee.

The strike of unionist workmen at the Parkgate Iron Works, near Rotherham, continues, but the non-unionists have resumed work on the same terms as before the strike, leaving the question in dispute to arbitration. Under these circumstances it is thought that the unionists will presently give way. A special appeal has been made on their behalf by the officials of the Iron Workers' Association, who state that £100 weekly will be required to support them whilst the strike lasts. A claim of 3/ per member of the association is consequently made for this special purpose.

The returns showing the quantity of coal sent to London by railway during the month of September set forth the fact that 26,000 tons more than in August were so conveyed. The Great Northern took 3000 tons more from the Birley pits, Sheffield, and there was a good increase over the Midland route. The Midland carried 142,548 tons; London & Northwestern, 108,609; Great Northern, 80,658; and Great Eastern, 39,465 tons. Newton Chambers & Company, of Thorncliffe, alone sent 5000 tons of Silkstone over the Great Northern, and six other collieries sent 10,000 tons of the same quality. Over the Midland, Clay Cross sent more than 3000 tons weekly, and Langley Mill about 2300 tons weekly. During the nine months the Midland carried 1,207,387 tons; London & Northwestern, 772,809; Great Northern, 709,714; and Great Eastern, 498,462 tons; the Great Western following with 413,587 tons, mostly from Wales and the West. A new colliery is being opened out at Treeton, near Sheffield, by the Fence Colliery Company, limited, one of the chief proprietors in which is Mr. Jaffray, of the Birmingham *Daily Post*. The first sod was cut on Thursday last, with a great deal of ceremony, by Mr. Jaffray.

There are no movements in the cutlery, saw and file trades of any importance. Best and good ordinary cutlery is well sustained in price owing to the stiffness of the ivory market and the continued dearness of other hafting materials. I hear somewhat vague rumors as to a prospective movement amongst some of the cutlers for an increase of wages, but until the matter has assumed a more definite aspect, I think it better to say very little about it.

THE FOREIGN IRON TRADE.

I am indebted for the following latest report on the French and Belgian iron trades to to-day's Paris correspondence of the Newcastle *Chronicle*, the letter being dated Paris, Sunday:

"In the Paris iron market business is reported as very calm at the moment, although the building trade has been giving out some rather large orders. Prices remain without variation, and some apprehensions are felt that the rise which it was hoped would become possible will be considerably retarded. In the Haute Marne, special qualities of iron, as also light plates and machinery, are in good demand, and the forges and rolling mills have their order books fairly filled. In the Nord there is an equally good demand for iron, the prices in the manufacturer's circulars ranging from £7. 12/ to £7. 16/, but it is said that, owing to the competition now being carried on, and the eagerness displayed to secure orders, no certain quotations can be given as correct. The same spirit of competition is pointed out in a correspondent's letter as existing in the Meurthe-et-Moselle district, where iron is quoted at from £7. 8/ to £7. 12/, but may, it is said, be obtained at a much lower figure.

"A steady demand for all kinds of iron is at the moment being made in the Belgian market. Plenty of orders can be had, but the price is so poor that very few manufacturers can be tempted to accept them. The last tender sent into the Belgian State Railway, for steel rails, quotes £9 per ton, a price which can hardly be said to pay the maker, while last week another firm contracted for the supply of Bessemer steel locomotive tires at £9. 7/, and for carriage tires at £9. 3/3 a ton. At Charleroi the autumn orders which have been received will suffice to keep the different manufacturers busy during the winter season, but at prices which render a reduction in the present prices of wages imperative, so as to hold up against the increasing competition now going on at home and abroad. Iron shows a certain tendency to become firm, and it is hoped the market will improve before the end of the year. Iron rails are almost neglected, owing to the substitution of steel for iron rails, which are now only made for export purposes, or for use by the tramways. The Cockerill Works have been favored with orders, 20 locomotives and 7000 tons of rails. Holland has also been given out some important orders in the Liege district for guns and springs and tires. A great reluctance is at the moment exhibited by the Belgian manufacturers to do business with Germany on account of some heavy failures which have recently taken place, and the commercial state of the latter country is such that the utmost caution should be used by those exporting goods or making consignments to German houses."

STAFFORDSHIRE AND BIRMINGHAM.

The iron trade hereabouts remains perfectly steady in all respects; prices are on the same basis as at quarter day, £10 being the accepted quotation for marked bars, with the customary 12/6 for the output of my Lord Dudley's Round Oaks establishment. At a few of the iron works the completion of shipping orders has given an aspect of unwonted activity but as soon as these have been dispatched, there will be a noticeable relapse. The attitude of the miners gives the iron masters much cause for uneasiness, inasmuch as the men seem determined to have an advance, in which case manufacturing coal will, doubtless, become dearer. At the Wolverhampton and Birmingham change gatherings, last week, no great amount of new business was transacted, although producers did not fail to point out to their probable customers the facts, just recorded, in order to stimulate business. In hardwares there have been several movements of interest during the week. The horse nail manufacturers, for instance, have agreed to advance the wages of their work people by sixpence per 1000. Plate locks have been reduced in price by an addition of 5 per cent. discount. Several descriptions of light iron foundry are reduced by 6d. to 2/ per cwt., including such articles as box iron beaters, air bucks, &c.

SOUTH WALES.

There appears to be some little improvement in the general condition of the Welsh iron works. At Tredegar Works there are now five furnaces in blast; the furnaces and mills at Abersychan are being restarted; Rhymney and Dowlais are producing a fairly good tonnage; Blænavan as well as Rhymney are doing rather more than has been the case lately, and a trifle more is being turned out at Ebbw Vale. An effort is being made to restart the North Woolwich and Pontnewynydd Works by means of a "limited" company, but the project hardly appears likely to meet with success. Sirbowry Works are being repaired prior to being again worked. The tin plate works remain very quiet, but there is still an enormous output of coal for London and for export.

THE METAL MARKETS.

The markets were fairly steady on Monday and Tuesday. On the latter day 100 tons of Chili bars sold at £82. 5/ to 82. 7/6 in sundry lots, but nothing was done in Australian copper, figures for which were purely nominal. In tin on the same day 50 tons of Straits were disposed of at £86, cash, and Australian at £82. 15/ to £83. Spelter and lead were firm at £25 and £23, respectively. On Wednesday nothing was done in copper, quotations being £82. 10/ for Chili bars, and £91. 10/ for Wallaroo. Tin was unsettled; Straits at about £85. 10/; spot and Australian, £82. 10/ to £83. On Thursday a little steadier tone became apparent, and on Friday the markets were firm. Seventy-five tons Chili bars were done at £82. 15/ to £83. Straits tin changed hands at £85. 10/ to £86. Lead was 5/ per ton easier, good soft English pig being on hand at £22. 15/.

Messrs. Von Dadelszen & North say: "*Copper.*—Up to Thursday the market ruled very quiet, with but little business reported in Chili bars, at about £82, but when the charters for the first fortnight of October were reported as 1400 tons, of which only 500 tons for England, a livelier demand sprung up at an advance of 10/ per ton. G. o. b. are quoted £82. 10/ to £83. Australian is quite nominal, in the absence of business; Wallaroo, £92. 10/; Burra, £89. 10/. English smelters are asking full prices for manufactured. *Tin.*—The business in Straits has been moderate, ranging between £85. 10/ and £86, cash, and for forward delivery from £84 to £85. 10/, according to time of delivery. More business was done in Australian, from £82. 10/ to £83, spot and forward. There is no change in the Dutch prices for Banca and Billiton. English in small demand, at smelters' prices. Tin plates are firm. Many makers have booked large orders, and prices are fully 1/ higher from the lowest point touched; good ordinary cokes from 22/ and upward; charcoal, 28 and upward. *Lead* maintains its position at £23. *Spelter*, although no official business reported on our Exchange, remains firm, at about £25 for Silesian; in outports, 5/ extra demanded. *Quicksilver* very dull; obtainable from first hands at £14, but second hand parcels are to be got much cheaper."

Latest Liverpool prices are:

Iron; f. o. b. in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Merchant bar	7	17	6 @	8	5	0
Merchant bar, in Wales	7	7	6 @	7	15	0
Staffordshire	8	10	0 @	11	15	0
Hoop	9	10	0 @	10	15	0
Sheet	11	10	0 @	11	15	0
Nail rod	8	10	0 @	9	0	0
Bar, best crown	8	10	0 @	8	15	0
Boiler plates	11	0	0 @	12	0	0

Tin Plates; f. o. b. in Liverpool, per box.

	£	s.	d.	£	s.	d.
Charcoal, I. C	1	7	0 @	1	10	0
Coke, I. C	1	2	6 @	1	4	0

Copper; Delivered in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Bolt and Sheathing	93	0	0 @	94	0	0
Tile	88	0	0 @	90	0	0
Tough cake	87	0	0 @	89	0	0
Best selected	90	0	0 @	91	0	0

Blasting in the Delaware, Lackawanna and Western Tunnel.

A correspondent who has visited the new tunnel of the Delaware, Lackawanna and Western Railroad, through Bergen Hill, thus describes the blasting operations:

We found the "blaster" in front of a rude box, like a laborer's tool chest, near the end of the tunnel. While he placidly puffs his pipe, he sorts out a great pile of cartridges loaded with "rend-rock" from the heaps in the box. "Rend-rock" looks like ordinary blasting powder made mushy and greasy by an addition of nitro-glycerine. It has fearful power. To the suggestion that his pipe is somewhat dangerous, he responds: "Oh! dear no. You could touch a match to one of them and it'd burn up just like sawdust, or maybe a little faster. It's only when it is confined that it explodes." He is a pleasant, bright, and intelligent chap, and gives his name as James Malone. Another blaster is James Clark, on the other shift at this face of the tunnel. Malone says he has been a blaster for nine years. In the earlier part of the work, each gang of drillers and strikers charged its own hole, and many of the men were careless about this delicate task. They did not tear off the top of each cartridge so as to insure its ignition when they slipped several into a deep hole, and sometimes the lower cartridge was not burned with the rest. This happened several times, once where Malone was working. He was striking. The driller set his drill into a hole to deepen it after a blast, not knowing, of course, that there was an unexploded cartridge there. At the first blow of the sledge the cartridge declared itself. Malone was simply knocked down by the flying handle of his sledge, but his comrade's hand was cut off by the drill. After several like accidents some careful and steady men were picked out to do all the charging and blasting. There are eighteen of them in all, working in two "shifts." While he talks Malone completes his selection of cartridges and piles them into a huge battered tin can, with a leathern bail like that of a bucket. He has about a half bushel of them in his can and stuffed in his bosom. Ten of them have fuses attached, for he is going to charge and fire ten holes in heading, bench and sides of this face of the tunnel. A large bunch of loose cotton wicking, soaked with oil, and a big ball of blue clay, of doughey consistence, complete his stock of materials. Then he lights his little lamp, sticks it in the front of his hat, sees that his pipe is drawing well, and starts off to his dangerous work.

Threading his way among the men still drilling on the bench, he climbs the steep slope of loose jagged rocks, a very unstable footing, to the heading. Although it is, as has been said, cut through to shaft No. 6, the roof is not high enough. There must be a clear 22 feet and 9 inches from the center of the arch to the road bed, by about 31 feet in width, in order to give sufficient space for walls, arches and road. So more blasting has to be done in the roof here. Malone's operations are very rapid and skillful. First he sounds with a stick the depth of the hole he is about to charge; then he glances at its surroundings to form an idea of the resistance to be overcome, and so determines the number of cartridges that it will require. He carries three sizes of cartridges, one about 4 inches long by 1 inch in diameter; another 6 inches long by 1¼ inches in diameter; the third fully 8 inches long by 1⅝ inches in diameter. If the hole is in the roof, where he is not troubled by water and mud, he simply pokes in the cartridge or two required, tamps the hole with blue clay, sticks a little ball of clay in some niche in the rock at a convenient distance and fixes the free end of the fuse in that ball of wet clay. Then come his preparations for lighting it. Taking a little bunch of the oiled cotton wicking, which is cut to about 9 inches in length, he lights it at his lamp, swings it about a few moments, then with a sudden "whish" extinguishes its flame and hangs it over the fuse near to the end furthest from the charge. This wicking, now called a "snuff," will light instantaneously when he is ready for it. In the bench holes he has more trouble. There he must use a long stick to work out the mud made by the dust from the drill and the water poured in by the driller. In the big hole that the steam drill has made in one place here, to a depth of over 9 feet, he uses a sort of bucket, an inch in diameter and 2 feet long, for this service. Into this great hole he puts six of the largest cartridges, in addition to the one that has the fuse attached, and this, as well as all the other bench holes, he tamps with sand instead of clay. Much more convenient than loose powder these cartridges are, he says, as he works. Water does not hurt them, and they are so much easier to handle. One after another he charges the ten holes, the drillers aiding him in clearing out the last in order. While he is thus engaged a thunderous roar reverberates through the cavern, then another, and another. The blasts at No. 6, where they are fewer in number, and consequently more quickly prepared, are being fired. They make the walls of solid rock tremble with their tremendous shocks, and we cannot repress a feeling of apprehension at the prospect of the commotion we are about to create here. The steam drill is taken apart and lugged out of harm's way. At length, all the holes are charged and everybody has gone out of the tunnel except the blaster and ourselves. In the dim light we can see the white bunches of cotton hanging from the fuses here and there, and they seem like spectral hands warning us away. Already the blaster has touched the flame of his lamp to the most distant "snuff," and it bursts into a blaze. From one bunch of "snuff" to another he goes rapidly, firing each in its turn, first the most inaccessible, then those on his way out. He has to skip about over the uncertain footing of loose rocks, great and small, with great agility and certainty of step, for a fall now might delay him one fatal moment too long. At a safe distance, the end of the arch trestles, we stop to survey the scene. In a few moments more the blaster joins us. The flames that he has started all burn brightly, giving a better view of the rocky face than we have yet had. Suddenly one of them changes its color from a golden to a red. The fuse has been set on fire. Another undergoes the same change, but before we can note a third among the ten a crash like thunder near at hand rends the air. Another follows it and another, between them noises not less dreadful from the hurling and falling of mighty masses of rocks. The first to explode are the smaller charges in the roof. After these follow other reports, infinitely more terrible, from the enormous charges in the bench. They follow close upon each other, two at one time seeming only one. Last of all, the enormous charge in the hole made by the steam drill is exploded. It seems to shake the great hill to its base. For a moment afterward we hear the rocks falling like drops of rain in a storm; but what a terrific rain this is, some of its drops weighing many tons each.

Who Invented the Telegraph?

The following letter appears in the London *News* of Oct. 27:

SIR: In a well deserved tribute to the memory of the late Sir Charles Wheatstone, in your paper of yesterday, you say: "In America it is common to claim for the late Prof. Morse the priority of discovery as regards the practical application of electricity to the work of the telegraph." The question what country may justly claim the honor of having been the first to produce the electric telegraph is one of great and general interest, and it is quite time that that honor is claimed for England. In the spring of 1869, a great public banquet in New York, at which the British Minister, Mr. Thornton, was present, was given to Prof. Morse, who, in his speech on that occasion, maintained this claim of priority for America against England on the ground of an invention by himself in 1832, which date he contrasted with that of 1837, when Messrs. Cook & Wheatstone took out their first English patent for an electric telegraph. It is probably a fact, as you say, that "Wheatstone knew nothing of Morse's theories and experiments when he was striving to obtain the attention of the scientific world to his own," but in a controversy which turns upon dates, I would call attention to the fact that so far back as 1823 a pamphlet was published in this country under the title of *Description of an Electric Telegraph, and of some Other Electrical Apparatus*, by Francis Ronalds," "printed for R. Hunter, No. 72 St. Paul's Church-yard, 1823." In this work Mr. Ronalds fully describes his invention, with illustrative diagrams, and foretells, in a striking manner, some of the public uses to which it might be applied. "Why," he says, "should not our kings hold councils at Brighton with their Ministers in London? "Why should our defaulters escape by default of our foggy climate?" "Let us have electrical *conversazione* offices, communicating with each other all over the kingdom, if we can." "Give me material enough and I will electrify the world." The telegraph so described in 1823 had been in fact constructed by Mr. Ronalds so far back as 1816, in which year he offered it to the then government, receiving an official reply that "telegraphs of any kind are now wholly unnecessary, and no other than the one now in use will be adopted"—dated, "Admiralty Office, 1816." The original letter, written by Mr. (afterward Sir John) Barrow, secretary to the Admiralty, is in my possession. In 1870 Mr. Ronalds received the honor of knighthood for his "early and remarkable labors in telegraphic investigations." As the dates and facts which I have given may tend to settle the question of priority between England and America with regard to the electric telegraph, you will, I hope, be able to find space for this communication. I am, Sir, your obedient servant, SAMUEL CARTER.

KENILWORTH, Oct. 23.

An American Metallurgist Among the Continental Iron Works.

The following letter, addressed to Mr. John W. Forney, as representative of the Centennial Commission in Europe, will be read with interest:

LONDON, Oct. 4, 1875.

MY DEAR SIR: I have just returned from a tour through the principal iron manufacturing districts of France, Germany and Belgium, and venture to hope that a few of my observations may possess some interest for you.

The great iron and steel manufacturing district of France is in the department of Loire, extending from Le Creuzot on the north to St. Etienne on the south. The two largest organizations are those of the Messrs. Schneider, at Le Creuzot, and Messrs. Petin, Gaudet & Co. (lately converted into a stock company), with works at several points between Lyons and St. Etienne. The only possible reason for the establishment of works in this section was the existence of coal, for there are no native iron ores in sufficient quantity, or of good enough quality, to warrant such great expenditure of capital for plant. The coal, too, is of a very poor quality, and all the ores have to be brought from great distances, involving extensive land carriage. Yet with all these disadvantages, the iron and steel industry of this section has been a successful one. The following I conceive to be some of the reasons for this success:

1. The ores are obtained in Algiers, Elba, Corsica and Spain, and are invariably of a quality suited for the production of the highest grades of iron and steel, and at the same time are very rich. For the most part, the iron companies own the mines, thus getting their ore at first cost.
2. The adoption of labor saving appliances.
3. Lower wages than obtained in England.
4. Absence of strikes.
5. Systematic management.
6. The manufacture of an excellent and uniform quality of product.

While the French iron masters complain that business is depressed, it is evident that there is nothing like the depression which exists in other countries. In the majority of cases the works are running on full time. A noticeable fact is that the French railway companies use almost entirely home-made rails. The government are now large consumers of heavy work, viz.: steel beams for ships, iron plates, armor plates and steel cannons.

None of the iron or steel companies intend exhibiting at Philadelphia, as they consider that the United States is quite able to take care of herself in the future, and with our vast resources, even with the removal of the tariff, we will not allow foreign manufacturers to undersell us. I have the assurance of many of the prominent iron men that they will visit us next year.

In Germany the depression in all branches of business is unparalleled, the iron and steel manufactures being in the worst condition, for they say there is no hope of better things. The reason given for this unsettled condition of affairs was always the fear of another war. In France the prospect of war has an exactly contrary effect.

In the great Westphalian iron district all the large companies, with a single exception, have shown a deficit for the past twelve months. Large quantities of English iron are going into Germany, and the German manufacturers are getting heartily sick of free trade. On the day that I left Dusseldorf a meeting of all prominent Westphalian manufacturers was being held for the purpose of petitioning the government to protect their work.

There is very little home consumption of iron and steel, which is a marked contrast to the condition of affairs in France. The bulk of the steel rails goes to Russia, she, in fact, being the salvation of the steel rail manufacturers in Germany, Belgium and England. The iron trade in Belgium appears to be in a very healthy condition, and while there is nothing like the prosperity of late years still there is none of the despondency so evident in Germany. The Belgians are naturally jubilant over their exports to England, but I believe the bulk of the iron is in the shape of beams, for which Belgium has always been celebrated, and, as I understand, there is but one beam mill in England this large export is not to be wondered at. In some late steel rail contracts for English roads Belgium has been able to underbid. Italy is extending her railway system, and an engineer of the Alta Italia Railway told me the other day at the John Cockerille Works, at Seraing, that he bought Belgium rails in preference to any other make. The works on the Meuse also use foreign ores very largely; in fact, wholly for steel. They come from Spain, Portugal and Africa, being brought all the way by water, the only transhipment being at Rotterdam into the river boats.

The Belgian iron masters have adopted very freely modern machinery, and are striving in every way to reduce the cost of production by reducing manual labor, employing improved furnaces, &c.

It is gratifying to our national pride to see many machines of American pattern in the Belgian works, while at Seraing the assistant engineer in the steel department had just returned from the United States, where he had been spending three months for the purpose of learning our practice. The result of his visit is that the new rail mill, about being erected, will be on the American plan, and when the Bessemer works are extended the genius of Holley and Fritz will crop out in them. When European engineers go to America to learn how to manufacture steel and roll rails, we have no cause to fear being beaten on our own ground. American inventiveness and its resultant labor saving machinery will be more than a match for the cheap labor of Europe.

It is said in Germany that on the revival of trade in the United States there will be a greater influx of skilled labor than ever before, for the men who make up this class are becoming disgusted with military rule, and with having the best three years of their lives taken from their trades. In Belgium, on the other hand, the men are contented, sober, industrious, and do not strike.

I believe that Belgian iron works will not take part in the Exposition, though many prominent men and engineers will go over. I was told that the King intends going, but I cannot vouch for the truth of the statement.

I neglected to state in the right place that Krupp will make a grand show, the goods being sent at the expense of the Prussian government. Other Westphalian works will not take part.

I have not yet worked out in detail the cost of production in the various works which I have visited, but my general impression is, at this moment, that our American iron and steel masters have nothing to fear from foreign competition if they will combine with their great mechanical improvements more thorough metallurgical work and systematic economy. We are making the same mistake in America that they have in England, viz.: in not more carefully working out details. You will be gratified to learn that nearly everybody I have met is either going, or wants to go, to Philadelphia next year, and I have been especially impressed with the fact that a large number of government officers from the various technical bureaus will go in their official capacities. This is more particularly true of Germany. Want of time must account for these disjointed notes. I am, very truly yours,

GEORGE W. MAYNARD,
22 Bedford Place, Russell Square.

Names for Our New War Ships.

For many years the ships of our navy were called after the States, principal towns, rivers, etc., of the country. This was a system very good in itself, and gave an idea of the size or class of the vessel. During the war and later the use of long misspelled Indian names brought this system into disrepute, and since that time many vessels have been renamed, but, unfortunately in a most absurd fashion, apparently in imitation of the British navy. A writer in the Philadelphia *Ledger*, speaking of the eight new sloops of war recently added to our navy, gives some very interesting matter concerning the vessels for which they are named. The vessels are: The Alert, Essex, Ranger, Adams, Enterprise, Alliance, Trenton and Huron; and the names selected for six of them recall some interesting incidents in our naval history.

The writer says that the Alert bears the name of a British vessel, taken by Captain Porter, in the Essex, in 1812. She was the first war vessel captured during that war. As the Essex was already crowded with prisoners from the previous capture of a transport, Captain Porter made an arrangement by which the Alert was converted into a "cartel" and sent into St. Johns, with the prisoners, sailors and soldiers, on parole. A "cartel" ship carries no cargo or ammunition, and only one gun for signals. The action in which the Alert was taken was brief, as the Essex had double her number of guns and men.

The Essex is named after the famous ship of that name, which, under command of Captain Preble, was the first vessel of the American navy to carry the pennant beyond the Cape of Good Hope. She went as convoy, in 1799-1800. She was also the first vessel of the American navy to show the American flag west of Cape Horn, Captain Porter commanding. Her record in the Pacific forms one of the most brilliant episodes in the war of 1812. She captured 4000 tons of British shipping. Her career closed in 1814, when she was destroyed by a superior British force in the harbor of Valparaiso.

The original Ranger, after which the new ship is christened, was the vessel in which Paul Jones made his memorable raid on the British coasts during the Revolution. She was one of the vessels which fell into the hands of the British at Charleston, South Carolina, in 1780. The first Adams, put in commission in 1800, saw no actual service till the war of 1812, when she was commanded by Captain Morris. After making several captures and escapes from superior force, she was burned by the British in Penobscot river, Maine, in 1814. At the time of her destruction she was stripped and dismantled, ready to be "hove out" for repairs. The original Enterprise, a schooner carrying 12 guns, was commissioned in 1800. She distinguished herself during the difficulties with France by capturing six French privateers and recapturing an American vessel, in less than a year. In 1803 she was in the Mediterranean, under command of Decatur, and it was her crew and commander who were the leading heroes in the feat of destroying the American ship Philadelphia, in the harbor of Tripoli. The Philadelphia, it will be remembered, had fallen into the hands of the enemy by getting aground on a reef. The Enterprise was afterward changed into a brig. In 1813, under the command of Lieut. Burrows, she captured the British ship Boxer. The commanders of both vessels fell in the engagement. The new rig having impaired her sailing qualities, the Enterprise was retired as a guard vessel.

Another name in the list of the new war ships is that of an old American ship in which Philadelphia has a special interest. She was built at Salisbury, Mass. Cooper, in his naval history, remarks: "The Alliance, as her name indicates, was launched about the time the treaty was made with France. She was the favorite ship of the American navy, and, it might be added, of the American nation during the war of the Revolution, filling some such space in the public mind as has since been occupied by her more celebrated successor, the Constitution. She was a beautiful and exceedingly fast ship."

The beginnings of the Alliance were by no means auspicious. Named in honor of the treaty between the United Colonies and France, she was placed under a French officer, Captain Landais, and commissioned to carry the Marquis Lafayette to France, on his return to his own country on leave of absence in 1779. With an ill-assorted crew, largely composed of shipwrecked English men-of-war sailors who had volunteered, she sailed from Boston on the 11th of January, and reached Brest on the 6th of February. On her passage a serious mutiny was discovered and quelled. Shortly after her arrival she was placed by Dr. Benjamin Franklin (then representing this country in France), in a squadron of five vessels, commanded by Paul Jones. In the famous naval action in which the Bon Homme Richard and the Serapis were the leading actors, the Alliance, still under command of Captain Landais, did as much damage to friends as foes. In June, 1780, Captain Landais sailed in the ship for America, but was deposed during the passage on the presumption of insanity. The command was then given to Captain John Barry. It was in Barry's hands that the Alliance made her reputation. "She was," says Watson, "in many engagements, and always victorious—she was a fortunate ship, was a remarkably fast sailer, could always choose her combat—she would either fight or run away—beating her adversary either by fight or flight." A "fo'castle yarn" concerning the Alliance is, that she was once chased by an enemy's two-decker, and that she ran fifteen knots by the log, with the wind abeam, in making her escape.

The peace of 1783 found the United States in no condition to maintain a navy. The few national vessels were sold. An effort was made to retain the famous Alliance, but a survey being held on her in 1785, she too was sold, in preference to incurring the expense of repairs. Benjamin Eyre, one of our old Kensington ship carpenters, was the first purchaser, and by him she was resold to Robert Morris. Her first mercantile trip was from Norfolk to Bordeaux, with a cargo of tobacco. Her next was to Canton, China, whence she returned in 1788. Her last voyage was to Cadiz, Spain, with flour. On her return, in 1790, she was sold for the materials in her hull. She was broken up, and her remains were laid upon Petty's Island (in the Delaware, opposite this city), rather a curious mode, we should now think of disposing of the timbers of an old ship. Relics of her were once very common in Philadelphia. Lafayette had a memento of her presented to him by Watson, and among General Jackson's treasures was a miniature ship, carved out of a piece of her timber. Thompson Westcott, Esq., of this city, has the material for a cane, "heavy and nearly as black as ebony." No doubt there are many more such relics in Philadelphia, and the owners would do a graceful thing by loaning or presenting them to the Centennial, to form an "Alliance cabinet." As late as 1859, the remains of the Alliance were frequently seen at ordinary stages of low water. Within the last five years, at remarkably low tides, the remains of timbers of the old favorite have been seen. It is an interesting coincidence that the keel of the new Alliance floats in the waters under which the relics of the old ship are hidden.

The United States Museum of Ordnance.

The United States Ordnance Museum is an interesting feature of the Washington navy yard which will well repay a visit. It is a square brick building, two stories high, and was erected on the recommendation of the late Rear-Admiral John A. Dahlgren, for the purpose of collecting within its walls specimens of all small arms in and out of service, shot, shell, torpedoes, and, in fact, nearly every piece of ordnance or instrument, with the exception of heavy guns, that has been invented for use in time of war. As you enter the door you are met by old Jack Holmes, the presiding genius of the institution. Jack has grown gray in the service, and has cast anchor here. He will take you in charge and point out the first three show cases on the right. These contain sections of shell cut open to show the inside construction. When you reach the east end an original Gatling gun meets the eye. This gun has six barrels and is turned with a crank when it is desirable to use it. Since it was manufactured improvements have been made to the model, and the Gatling guns now in service have ten instead of six barrels. Near it is a curious looking arm called the Billinghurst battery, invented during the war, but never used. This battery has some 25 barrels, laid along in a row on a two-wheel carriage, and so pointed that when the charges in them are exploded, as they can be all at once, the bullets scatter in every direction. The barrels of this battery are about the same caliber as the Springfield rifle. In front of the Billinghurst is the Floyd breech-loading 3 pound rifled gun, the invention of John B. Floyd, who was Secretary of War under James Buchanan. The cases along the north wall are filled with shot and shell, broken and burned while being experimented with, and other curiosities. At one of the windows looking north stands a shattered section of the stern post of the Kearsarge, in which is imbedded an unexploded shell fired from the rebel pirate Alabama in the memorable engagement off Cherbourg. Had that shell exploded, the probabilities are that Captain Winslow and his ship would have gone to Davy Jones's locker. Passing on to the west end of the building, among the interesting objects you will see is a gun said to have been brought over by Cortez and used in the contest of Mexico. It was cast in the year 1490, two years before Columbus discovered America, and was captured by the United States forces at Alvarada, Mexico, in 1846. It is a breech loader, but of a clumsy pattern; that portion of it where the charge is inserted is about 8 inches long, 4 inches in diameter, and shaped like a flat iron on top, having a handle by which it can be removed from the embrasure in the gun when it is to be loaded; it is round on the bottom, and when placed in position for firing is secured by a heavy iron pin or key at the back. The cannon is certainly a curiosity, and it disproves the general impression that breech loaders are a new invention. Near the Cortez gun is a beautiful 12 pound Dahlgren brass boat howitzer, mounted on a handsome wrought iron carriage. The three cases on the right of the door are principally devoted to fuses and pieces of broken missiles. Along by the windows looking south are the shells of torpedoes of every description. Most of them are of rebel invention, and were picked up by the United States fleets in Southern rivers and harbors, but there are some that were designed by the officers of our navy. Among them is a fac-simile of the torpedo with which the late Commander Cushing blew up the rebel ram Albemarle, at Plymouth, N. C., in October, 1864. It is conical shaped, about 2½ feet long by about 10 inches in diameter, and made of copper. At the butt end is an appurtenance by which it can be attached to a bloom or spar when it is charged and ready for use. Few who look at this torpedo can scarcely imagine how terribly its prototype did its work on the side of the monster that at one time bade defiance to our navy. After showing you the torpedoes and gun at the foot of the stairs old Jack Holmes will invite you to step up to the second floor. As you walk up the polished steps your attention is attracted by an immense circle on the side of the stair wall, formed with cutlasses, with brass guards attached to the hilt. In the center of this circle is the figure of an eagle grasping the shield, &c. When the top of the stair is reached a number of cases containing the Remington and other improved arms are seen along the walls. At the west end is a model of the cob or ordnance dock at New York, while at different places throughout the room are models of guns, turrets, boats and other appliances used in naval warfare. On the gun racks are weapons of every size and calibre, from the ancient blunderbuss to the sixteen shooter. The ceilings of both stories are ornamented with stars and diamonds, formed of swords and bayonets, while on the cross beams of the upper story miniature cannon are pointed in every direction, and beside them are small stacks of shot.

The Mechanical Age.

The London *Times*, criticising Lord Derby's Manchester speech, says: "However quick other countries may have been to develop the great mechanical discoveries of the century, it is to England that those discoveries are mainly due; and our riches have been derived as much from the genius and patient intelligence of men like Stephenson and Farnday, as from our stores of coal and iron. But until recently manufactures and machinery were regarded very much as outlying provinces of human energy, which might be left to take care of themselves. They brought wealth to the country and fortunes to individuals, but they were regarded as no more a matter of general concern than any other trade. They are now recognized as a kind of public care; and even in his capacity of Foreign Secretary, Lord Derby was invited at Manchester to treat them as of primary importance. Without going the length of Dr. Playfair the other day, and treating the natural science as almost a substitute for all human culture, it is evident that, as a matter of fact, all culture is being brought to bear upon them, and that they are absorbing energy and attracting thought in every sphere of life. In view of this remarkable revolution of thought, one is a little provoked by the very matter-of-fact reasons which are usually alleged in explanation of it, and Lord Derby, in the greater part of his Manchester speech, was too true to his habitual caution in contenting himself with reiterating them. Labor, he says, is dear, and is becoming dearer; and it is consequently more and more necessary to invent labor saving machinery. Similarly at Leeds, the other day, even the apostles of science could find little more to tell us than that other nations are threatening to undersell us, and that we need all scientific appliances to hold our own. All this is, no doubt, true, but the reality is too vast and broad to be adequately represented by such statements of the case. To say that we must invent better machinery because labor is dear, however accurate, is nevertheless something of a reversal of the order of facts. What has made labor dear in England? Above all things the invention of machinery. Railways and other engineering discoveries have laid open the whole world to laborers, and have given them an independence they could never otherwise have enjoyed. The press, the telegraph, and every other mechanical agency by which human efforts are united and organized, have contributed to the same end; and the workmen who resisted the introduction of machines were struggling against the most potent instruments for their own elevation. Invention, in short, has always contained within itself the seeds of its own development and propagation; and though necessity is the mother of invention, the necessity must be regarded in a wider sense than usual if full justice is to be done to the wonderful phenomena of our time. It is the necessity of the mind, as well as of the body, which prompts discovery, and what we see is but the inevitable result of the slow but sure pressure of intellectual and moral impulses. A machine is only matter animated by intelligence; and it is not merely because the wants of men have grown more numerous, but because their intellects have grown more active, that they have at length reached a stage of their development at which they are concentrating their energies on asserting the dominion of intelligence over nature. It is this which is implied when we call the present a mechanical age."

London Metal Market.

(From The Mining Journal.)

	£.	s.	d.	£.	s.	d.
Copper—₱ ton.						
Best Selected	91	0	0	92	0	0
Tough Cake & Tile	89	0	0	90		
Sheathing and Sheets	95	0	0	96		
Bolts	97	0	0	98	0	0
Bottoms	98	0	0	99	0	0
Old	80	0	0		0	0
Australian, Wallaroo	92	10	0	93	10	0
" other brands	89	10	0	90	0	
Chil bars, g. o. b	82	0	0	83	10	0
Wire, ₱ lb.	0	0	11¾		0	
Tubes, "	0	1	0⅝		0	
Brass—₱ lb.						
Sheets	0	0	9	0	0	10
Wire	0	0	9¼	0	0	0
Tubes	0	0	9⅜	0	0	11¾
Yellow Metal Sheathing	0	0	7⅜	0	0	8¼
Sheets	0	0	8	0	0	8
Spelter—₱ ton.						
Foreign on the spot	24	15	0	25	0	
" to arrive	25	0	0		0	
Zinc—₱ ton.						
In Sheets	31	10	0	0	0	
Quicksilver—₱ bottle.	14	10	0	0	0	0
Tin—₱ ton.						
English Blocks	89	0	0	0	0	0
Ditto Bars (in bris.)	90	0	0	0	0	0
Ditto Refined	92	0	0	0	0	0
Banca	91	0	0	0	0	0
Straits	88	10	0	86	0	0
Australian	84	10	0	85	10	0
Tin Plates—₱ box.						
IC Charcoal, 1 qual.	1	10	0	1	11	0
IX " 1 qual.	1	16	0	1	17	0
IC " 2 qual.	1	5	0	1	6	0
IX " 2 qual.	1	11	0	1	14	0
IC Coke	1	1	0	1	2	0
IX "	1	7	0	1	9	0
Canada Plates, ₱ ton.	14	10	0	15	0	0
" at works	14	0	0	15	0	0
Iron—₱ ton.						
Bars Welsh, in London	7	15	0	8	—	0
" to arrive	7	17	6	8	0	0
Nail Rods	8	5	0	9	10	0
Nail Rods, Staff'd in L'ndon	8	15	0	9	10	0
Bars	9	7	6	9	10	0
Hoops	10	5	0	10	10	0
Bars at Works	8	10	0	9	5	0
Hoops ditto	9	5	0	11	0	0
Sheets, single, and plates	11	0	0	14	10	0
Pig, No. 1, in Wales	5	0	0	5	10	0
Refined metal ditto	7	0	0	8	0	0
Bars, common ditto	7	0	0	7	10	0
Do, merchant, Tyne or Tees	7	17	6	8	0	0
Ditto, Railway, in Wales	6	10	0	7	0	0
Ditto, Swedish, in London	14	10	0	15	0	0
To arrive	14	10	0	—	0	0
Pig, No. 1, in Clyde	3	3	0	3	5	0
Ditto, f.o.b., Tyne or Tees	2	15	0	3	0	0
Ditto, Nos. 3, 4, f.o.b	2	13	0	2	15	0
Railway Chairs	4	0	0	4	10	0
" Spikes	12	0	0	13	0	0
Swedish boiler plates	25	0	0	25	0	0
" sheets and strips	28	0	0	29	0	0
Indian Ch'coal Pigs in L'don		0	0		0	0
Steel—₱ ton.						
Swedish, in kegs (rolled)		—			—	
Ditto (hammered)	19	0	0	0	0	0
Ditto, in faggots	20	0	0			
English, spring	18	0	0	22	0	0
Lead—₱ ton						
English Pig, common	23	0	0	23	5	0
Ditto, LB	23	5	0		0	
Ditto, WP	24	0	0	0	0	
Ditto, Sheet	24	10	0		0	0
Ditto, Red Lead	25	0	0	—	0	0
Ditto, White	30	0	0	32	0	0
Ditto, Patent Shot	26	10	0	27	—	
Spanish	22	10	0	22	15	0

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† Add 6s. for each X.

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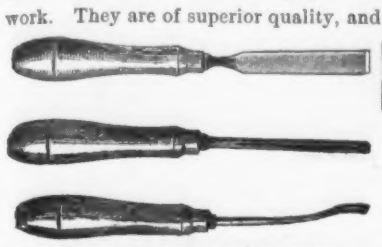

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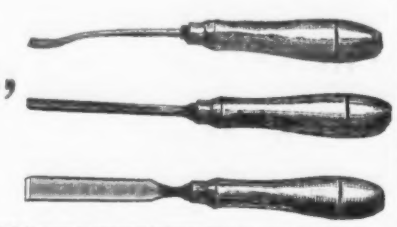

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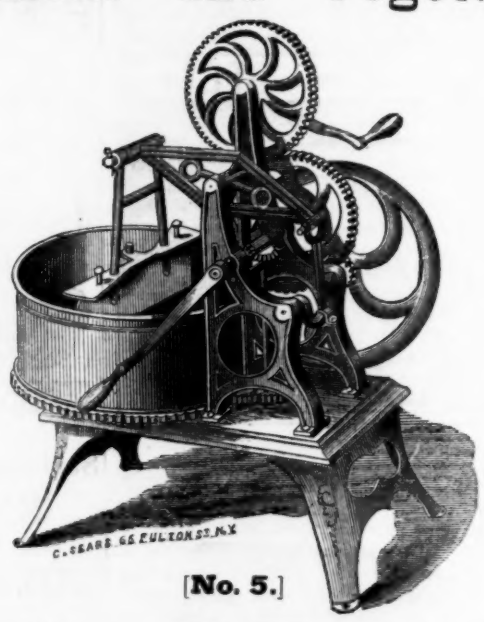

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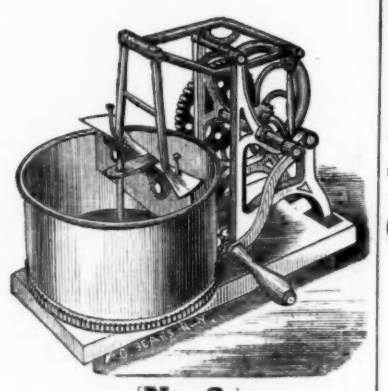

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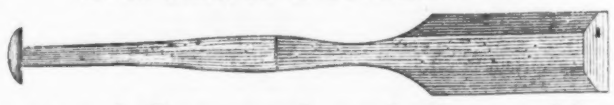

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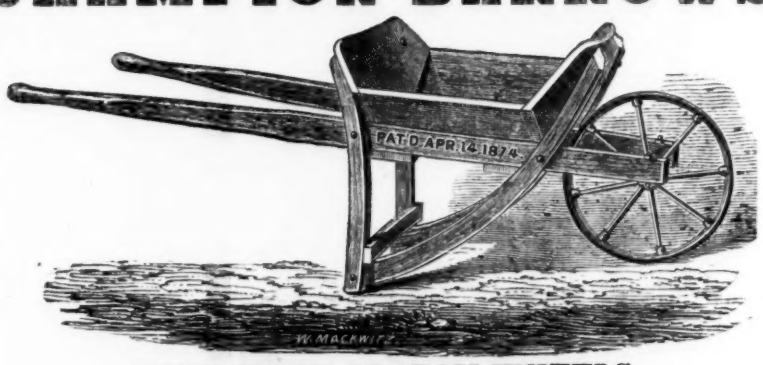

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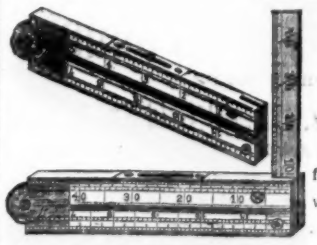

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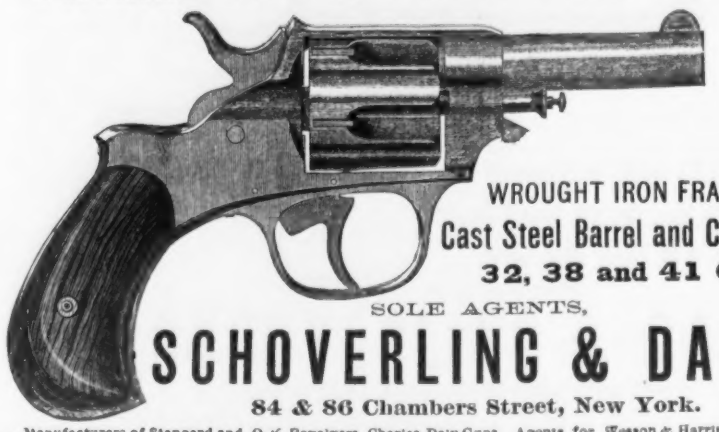

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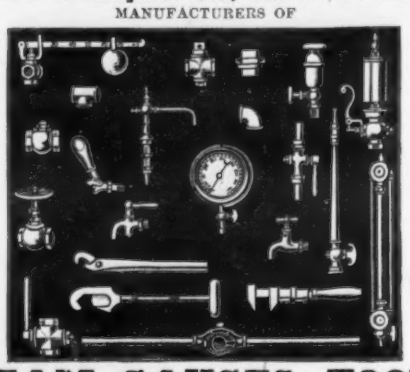

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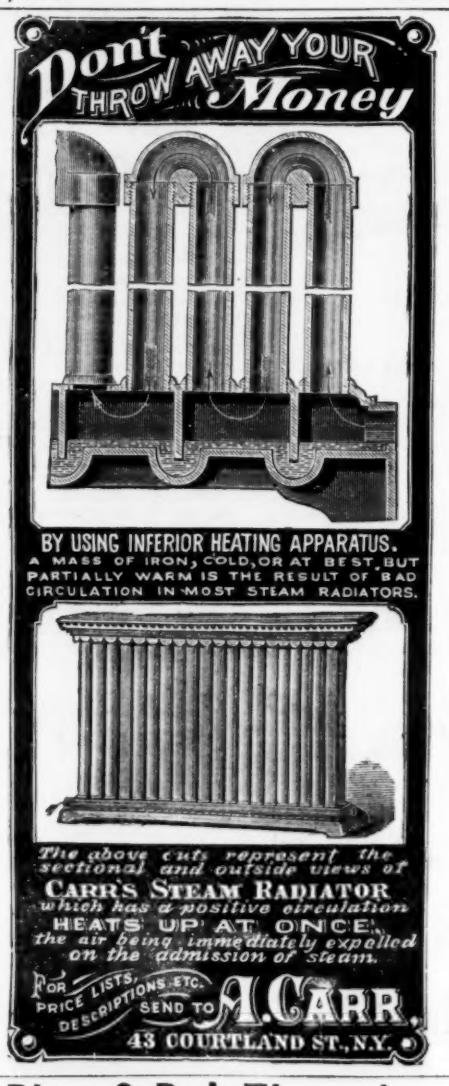
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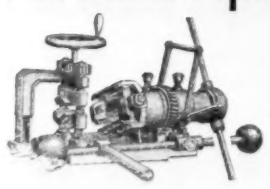

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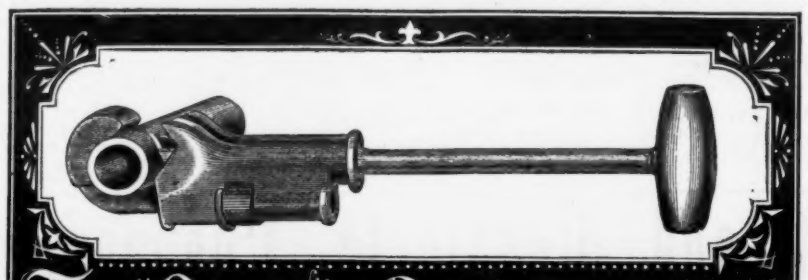

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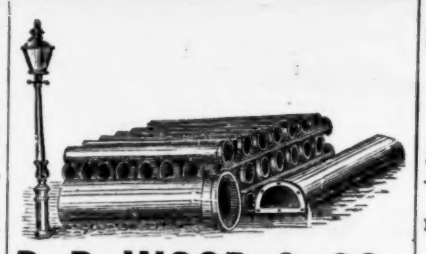

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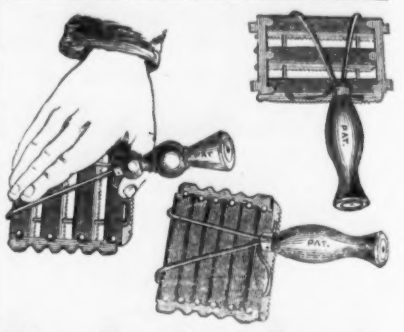

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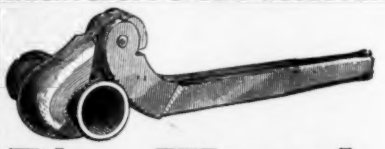

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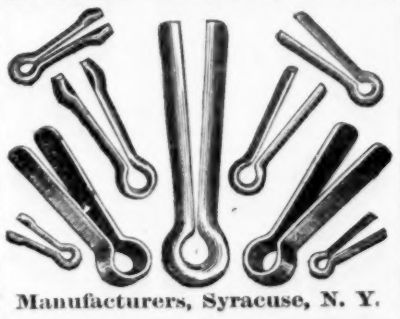

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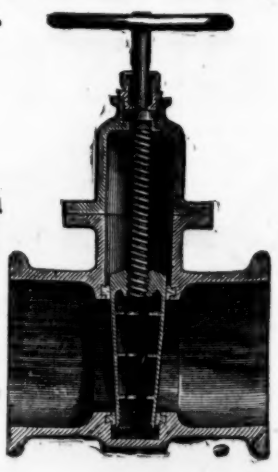

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Mack & Co., Rochester, N. Y.....25
Weed N., 4 and 6 Gold, N. Y.....36

Elevators, *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill.....9
Hoake Machine Co., 279 Cherry, N. Y.....36
Whittier Machine Co., 1176 Tremont, Boston, Mass..38
Otis Bros. & Co., 348 Broadway, N. Y.....9

Emery,
The Union Stone Co., 6 Exchange, Boston.....37

Emery Cloth.
The Union Stone Co., 6 Exchange, Boston.....37

Emery Wheels, *Makers of.*
Am. Twist Drill Co., Woonsocket, R. I.....36
Brady Mfg. Co., 249 Plymouth, Brooklyd, N. Y.....37
The Union Stone Co., 6 Exchange, Boston.....37

Encaustic Tiles, *Importer of.*
Findley Alex., 93 Maiden Lane, N. Y.....36

Engineers, Machinists, etc.
Hall Edward J., Jr. 452 Franklin, Buffalo, N. Y.....6
Bonsnall James, 1056 Beach, Phila.....37
Moore James, cor. 19th and Buttonwood, Phila.....36

Engines, Steam. *Makers of.*
Hartford Foundry and Machine Co., Hartford, Ct....33
Lovegrove & Co., 121 South 4th, Phila.....39
Stanley & Wells, Binghamton, N. Y.....32
Tate A. C. & Co., 97 Dey, N. Y.....34
Utica Steam Engine Co., Utica, N. Y.....32
Woodruff Iron Works, Hartford, Conn.....38

Engravers.
Collins, Geo. B. 19 Warren, N. Y.....28

Fan Blowers. *Makers of*
Landis Ezra F., Lancaster, Pa.....18

Faucets, Brass, *Makers of.*
McNab & Harlin Mfg. Co., 76 John, N. Y.....34

Faucets, *Self-Measuring, Makers of.*
Enterprise Mfg. Co., of Pa., Phila. and N. Y.....34

Files, *Importers of.*
Carr J. & Riley 82 John, N. Y.....32
Fisher Joseph S., 411 Commerce, Phila.....11
Krause Peter A. & Co. 25 Fulton, N. Y.....8
Moss F. W., 80 John, N. Y.....32
Sanderson Bros. & Co., 16 Cliff, N. Y.....32
Spear & Jackson, 116 Duane, N. Y.....33

Files, *Manufacturers of.*
Anamantine File Works, Providence, R. I.....18
American File Co., Pawtucket, R. I.....9
Auburn File Works, 89 Chambers, N. Y.....8
Barnett G. & H. 45 and 48 Richmond, Phila.....8
Draper C. F. & Co., Sing Sing, N. Y.....8
Wm. Gardner's Sons, 575 Grand, N. Y.....8
Heller L. B. & Co., Newark, N. J.....8
Heller & Bros., Newark, N. J.....8
Hiscox File Mfg. Co., Lowell, Mass.....33
Madden & Cockayne File Co., Middletown, N. Y.....8
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila.....8
Nicholson File Co., Providence, R. I.....28
Paul Chas. B., Williamsburgh, N. Y.....8
Walsh, Coulter & Flagler, 83 Chambers, N. Y.....8

Fire Brick, *Makers of.*
Anness Chas. & Sons, Woodbridge, N. J.....28
Berry Wm. H. & Co., Woodbridge, N. J.....28
Brooklyn Clay Retort and Fire Brick Works, Van Dyke, St., Brooklyn, N. Y.....28
Bell & Bacon, Troy N. Y.....28
Hall A. & Sons, Perth Amboy, N. J.....28
Hall A. & Sons, Buffalo, N. Y.....28
Harbison & Walker, Pittsburgh, Pa.....28
Horton & Mabie, Peekskill, N. Y.....28
Kreischer H. & Son, 58 Goerck, N. Y.....28
Miller S. P., 309 S. 5th, Philadelphia.....28
Newkumet Philip, 23d and Vine, Phila.....28
Newton & Co., Albany, N. Y.....28
Valentine M. D. & Bro., Woodbridge, N. J.....28
Watson John R., Perth Amboy, N. J.....28
Weaver Adam, 1632 E. 15th, N. Y.....28

Flint and Emery Paper and Cloth.
Baeder, Adamson & Co., 730 Market, Phila.....6

Fluor Spar.
Schweitzer Mfg. Co., 57 Reade, N. Y.....4

Fluting Machines. *Makers of*
Sommer Henry, 8 to 12 Pearl, Newark, N. J.....31

Forges, Portable, etc.
Place George, 121 Chambers, N. Y.....9

Forgings.
Johnson J. B., Richmond Va.....37

Founders and Machinists.
Foundry Facing Co., 121 Chambers, N. Y.....4

Furnaces. *Makers of*
Richmond & Potts, 119 S. Fourth, Phila., Pa.....5

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y.....4

Gas Fixtures. *Makers of.*
Bradley & Hubbard Mfg. Co., 21 & 23 Barclay, N. Y..40

Gong Bells. *Makers of*
Edw. Sweeney, 4 Duane, N. Y.....8

Governors.
Hartford Governor Co., Hartford, Ct.....39
Junius Judson & Son, Rochester, N. Y.....38
Shive Governor Co., Bethlehem, Pa.....38

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y.....37
Worthington & Sons, North Amherst, O.....37

Guns, &c.
Schoverling & Daly, 84 Chamber St.....26
Tryon Edw. K., Jr., & Co., 19 N. Sixth, Philadelphia..16
Windmuller Louis & Roelker, 20 Reade N. Y.....20

Gunpowder. *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y.....32
Lafin & Rand Powder Co. 21 Park Row, N. Y.....32

Hammers, etc., *Manufacturers of.*
Emmet Hammer Co., Brooklyn, E. D., N. Y.....13
Hammond B., Gafford, Ct.....8

Handles. *Makers of*
N. Carolina Handle Co., 79 Reade, N. Y.....11
Greensboro' Handle Works, 108 Chambers, N. Y.....6

Hardware Commission Merchants.
Dodge William A., 96 Chambers, N. Y.....10
Graham & Hames, 85 Chambers, N. Y.....34
Heaton & Denckla, Phila. and N. Y.....6
Peck G. Webster, 110 Chambers, N. Y.....8
Walbridge G. B. & Co. 99 Chambers, N. Y.....31
Walsh, Coulter & Flagler, 83 Chambers, N. Y.....8
Wilson J. Clark & Co., 81 Beekman N. Y.....24

Hardware Dealers.
Betts & Burger, 95 Chambers, N. Y.....18
Lloyd, Supplee & Walton, 625 Market, Phila.....10
Quackenbush, Townsend & Co., 59 Reade, N. Y.....34
Shepard Sidney & Co., Buffalo N. Y.....31
Wilson J. Clark & Co., 81 Beekman, N. Y.....24

Hardware Importers.
Baker Hermann & Co., 101 Duane, N. Y.....33
Field Alfred & Co., 9 Chambers, N. Y.....33
King, Briggs & Co., 80 Chambers, N. Y.....11
Van Wart & McCoy, 134 and 136 Duane, N. Y.....10
Turnor R. A., 78 Chambers, N. Y.....11
Windmuller Louis & Roelker 20 Reade N. Y.....20

Hardware Manufacturers.
American Spiral Spring Butt Co., 82 Beekman, N. Y..40
Cowles Hardware Co., Unionville, Ct.....37
Enterprise Mfg. Co., Phila.....34
Hart, Bliven & Mead Mfg. Co. 243 Pearl N. Y.....34
Middletown Tool Co., 18 & 20 Cliff, N. Y.....6
Miller's Falls Mfg. Co., 78 Beekman, N. Y.....25
Pratt & Co., Buffalo, N. Y.....35
Providence Tool Co., Providence, R. I.....15
Schweitzer Mfg. Co., 57 Reade, N. Y.....27
The Hull & Belden Co., Danbury, Conn.....33
Phelan Edward, 113 Chambers, N. Y.....6
Union Mfg. Co. 99 Chambers, N. Y.....7
Van Wagoner & Williams, 82 Beekman, N. Y.....40
Wilson Mfg. Co., 37 Chambers, N. Y.....24

Hardware Specialties.
American Mfg. Co., New Haven, Conn.....27
Bivington & Northup Rochelle, Ills.....9
Grant & Co., Newark, N. J.....13
Langdon Mitre Box Co., Millers Falls, Mass.....28
Post C. C., Burlington, Vt.....16
Shepard Sidney & Co., Buffalo, N. Y.....31

Hoes, *Maker of.*
Hicks O. H. & Co., Baltimore, Md.....6

Hoisting Engines. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill.....9
Otis Bros. & Co., 348 Broadway, N. Y.....9

Horse Hay Forks and Fixtures, *Makers of.*
Nellis A. J. & Co., Pittsburgh, Pa.....40

Horse Nails, *Makers of.*
Ausable Horse Nail Co., 35 Chambers, N. Y.....18
Globe Nail Co., Boston, Mass.....18
Pratt & Co., Buffalo, N. Y.....31
Putnam S. S. & Co., Neponset, Mass.....8

Horse Shoes, *Makers of.*
Burden Iron Works, Troy, N. Y.....4
Rhode Island Horse Shoe Co., Providence, R. I.....7
Schoenberger & Co., Pittsburgh, Pa.....4
Semple, Birge & Co., St. Louis.....8

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y.....36

Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co..39

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y.....4
Coleman & Bro., Louisville, Ky.....4
Crane U. O., 101 John, N. Y.....4
Hatry A. G., Pittsburgh, Pa.....4
Hazard T. D., 204 Pearl, N. Y.....4
Smith W. Minor, 95 Beaver, N. Y.....17

Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y..18

Iron, Charcoal, *Warm or Cold Blast,*
Quincy John W., 98 William, N. Y.....4

Iron Commission Merchants.
Justice Cox Jr. & Co., 393 Walnut, Phila.....5
Hand Jas. C. & Co., 614 and 616 Market, Phila.....6
Main Bros., 228 Dock, Phila.....5
Spooner & Collins, St. Louis, Mo.....4

Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y.....4

Iron Pig, *Manufacturers of*
Parrott Peter P., Greenwood Fce., Orange co., N. Y. 4

Iron Dealers.
Abeel Brothers, 190 South, N. Y.....4
Bonnell, Botsford & Co., Youngstown, O.....4
Borden & Lovell, 70 and 71 West, N. Y.....4
Cleveland, Brown & Co., Cleveland, O.....6
Cooney Daniel F., 83 Wasnington, N. Y.....4
Huerstel G., 99 Market Slip, N. Y.....4
Fuller, Lord & Co., 139 Greenwich, N. Y.....4
Fuller, Dana & Fitz, 110 North, Boston.....2
Wm. Gardner's Sons, 575 Grand, N. Y.....4
Harrison & Gilloon, 558 to 562 Water, N. Y.....4
Holden, Hopkins & Stokes, 104 Joon, N. Y.....4
Jackson & Chase, 206 and 208 Franklin, N. Y.....4
Judson B. F., 457 and 459 Water, N. Y.....4
Matthews Chas. W., 133 Walnut Phila.....5
Moseley, Hodgman & Co., 89 Washington, Boston, Mass.....5
Ogden Wallace, 85, 87, 89 and 91 Elm, N. Y.....4
Pierson & Co., 24 Broadway, N. Y.....4
Quincy John W., 98 William, N. Y.....4
Reed John H. & Co.....6
Richards D. W. & Co., 92 Wangin St., N. Y.....4
Snyder Asa, Richmond, Va.....4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y.....4
Warner A. B. & Sons, 28 and 29 West, N. Y.....4
Williamson James & Co., 69 Wall, N. Y.....4
Whitney A. R. & Bro., 58 Hudson N. Y.....4

Iron, *Manufacturers of.*
Britannia Iron Works, Middlesbro', Eng.....6
Burden Iron Works, Troy, N. Y.....4
Cleveland Rolling Mill Co., Cleveland, O.....6
Coffin Wm. E. & Co., 8 Oliver, Boston.....4
Boston Rolling Mills, 17 Batterymarch, Boston.....4
Everson, Macrum & Co., Pittsburgh, Pa.....4
J. & J. Rogers Iron Co., Ausable Forks, N. Y.....5
Lackawanna Iron and Coal Co., Scranton, Pa.....5
Leonard John, 439 & 451 West st., N. Y.....4
McIntyre & Co., Richmond, Va.....12
Milwaukee Iron Co., Milwaukee, Wis.....6
Old Dominion Iron & Nail Works Co., Richmond, Va. 6
Oxford Iron Co., 81 Washington, N. Y.....5
Phoenix Iron Co., 410 Walnut, Phila.....5
Rowland Wm. & Harvey, Phila.....40
Snoenberger & Co., Pittsburgh, Pa.....4
Taylor, Mitchell & Pond, Massillon, O.....4

Iron, Swedish, *Importers of.*
Fuller, Dana & Fitz, Boston, Mass.....2
Jessop Wm. & Sons, 91 and 93 John, N. Y.....32
Mitander Nils, 60 William, N. Y.....4

Keys and Cutters, *Manufacturers of.*
Barnes Geo. & Co., Syracuse, N. Y.....26

Knitting Machines, Upright Rotary, *Makers of.*
Clark Tompkins, Troy, N. Y.....26

Lace Leather, *Manufacturers of.*
Fales Geo. S., Pawtucket, R. I.....16

Lanterns, *Manufacturers of.*
Dietz R. E., (Tubular) 51 and 56 Fulton, N. Y.....4
Howard & Morse, 45 Fulton, N. Y.....2
White Mfg. Co., Bridgeport, Ct.....16

Lead Pipe, &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa.....2

Locks, *Manufacturers of*
American Lock Mfg. Co., Cazenovia, N. Y.....10
Bonannan Wilson, Broadway and Kossuth, Brooklyn, E. D.....17
D. K. Miller Locks Co., 212 Cherry, Philadelphia.....40
Romer & Co., Newark, N. J.....4
Tower John J., 96 Chambers, N. Y.....34
Union Nut Co., 78 Beekman, N. Y.....17
Yale Lock Mfg. Co., 298 Broadway, N. Y.....33

Lubricators, (Patent) *Maker of.*
Crossley H., Brooklyn, N. Y.....36

Machinery, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H.....39
Hendey Machine Co., Wolcottsville, Ct.....19
Pratt & Whitney Co., Hartford, Conn.....38
Sellers Wm. & Co., 1600 Hamilton Phila.....39
The Hull & Belden Co., Danbury, Conn.....33
Walker Joseph, 915 Market, Phila., Pa.....36
Wetherill Robert & Co., Chester, Pa.....38
Whittier Machine Co., 1176 Tremont, Boston, Mass...38
Wood Thomas 2106 Wood, Phila.....39

Machine Screws, *Makers of.*
Boone W. C., 28 Humboldt, Brooklyn, E. D.....13
Ducreux C., 93 Elizabeth, N. Y.....12
Lyon & Fellows Mfg. Co., Williamsburg, N. Y.....12
Reynolds & Co., New Haven, Conn.....4

Machinists' Tools, *Makers of.*
Blaisdell P. & Co., Worcester Mass.....38
Harrington Edwin & Son, 15th st. and Pa. ave., Phila. 9
Jones, Lamson & Co., Windsor, Vt.....35
Le Count C. W., South Norwalk, Conn.....10
New Haven Mfg. Co., New Haven, Ct.....39
Van Haagen C. & Co., Phila., Pa.....36

Malleable Articles, *Maker of.*
Hammer & Co., Branford, Ct.....18

Measuring Tapes.
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N. Y17

Metal Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y.....2
Cort N. L. & Co., 220 & 222 Water, N. Y.....2
Crane C. O., 108 John, N. Y.....4
Crocker Bros., 32 Cliff, N. Y.....9
Fuller, Dana & Fitz, Boston, Mass.....2
Gregg H. L. Co., 108 Walnut, Phila.....5
Lefferts J. C., 241 Pearl, N. Y.....4
W. J. Hammond, Pittsburgh, Pa.....2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila.....20
Quincy J. W., 98 William, N. Y.....2
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago.....8
Thomison A. A. & Co., 213 and 215 Water, N. Y.....2
Van Wart & McCoy, 134 and 136 Duane N. Y.....2

Metaline.
American Metaline Co., 61 Warren.....28

Metallurgists.
Britton J. Blodgett 339 Walnut, Phila.....6
Hart Edward, Easton, Pa.....17
Maynard & Van Rensselaer, 265½ Broadway, N. Y.....6
School of Mines, E. 49th, N. Y.....6
Wallace & Humphrey, 113 Walnut, Phila.....6

Metal Roofing.
Hickcox Mfg. Co., 280 Pearl, N. Y.....4

Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa.....28

Miners' Candles. *Makers of*
James Boyd's Sons, 10 and 12 Franklin, N. Y.....30

Mining Spikes
Roseberry Geo. D., Pottsville, Pa.....4

Molders' Tools.
Carter H., 290 Pearl, N. Y.....10

Molding Machines, *Makers of.*
P. & F. Corbin, 37 Chambers, N. Y.....36

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y.....40

Nails,
Schoenberger & Co., Pittsburgh, Pa.....4

Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y.....34

Nickel Plates.
Coit A. T., 47 Beekman, N. Y.....17
Hartman John, 37½ N. Seventh, Philadelphia.....2
New York Nickel Plating Co., 133 West 25th, N. Y..27
Owen S. S. & Co., 121 E. 13, N. Y.....27
Roehrig, Fred Wm., 217 Center, N. Y.....27
Wilder & Co., 114 Fulton, N. Y.....17

Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila.....40

Note Broker.
Gallaudet F. W., 3 and 5 Wall, N. Y.....5

Nuts, Bolts, etc., *Makers of.*
American Bolt Co., 210 Lawrence, Lowell, Mass.....13
Carpenter David & Sons 402 Water N. Y.....4
Clark Bros. & Co., Millsdale, Conn.....12
Fuller, Lord & Co., 139 Greenwich, N. Y.....4
Haskell W. H. & Co., Pawtucket, R. I.....19
Hoopes & Townsend, 1291 Buttonwood, Phila.....12
Lewis, Oliver & Phillips, Pittsburgh, Pa.....18
New Haven Nut Co., Westville, Ct.....10
Old Colony Rivet Works, 116 Chambers, N. Y.....12
Roseberry Geo. D., Pottsville, Pa.....4
Russell, Birdsall & Ward, Port Chester, N. Y.....40
Plumb, Burdict & Barnard, Buffalo, N. Y.....40
Shelton Co., Birmingham, Conn.....34
Sternbergn J. H., Reading, Pa.....15
Union Nut Co., 78 Beekman N. Y.....17

Oil Lubricating *Makers of*
Lester Oil Co. 183 Water, N. Y.....37

Oil Stones, *Makers of.*
Boyd & Chase, 107th street and 1st avenue, N. Y.....37

Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia.....5

Ore Crushers.
Blake Crusher Co., New Haven, Ct.....38

Packing for Engines, &c., *Manufacturers of.*
Glanding Jas. & Co., 115 Queen, Philadelphia.....38

Paints and Oils, *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y.....
Empire Iron Clad Paint Co., 20 West B'way, N. Y....16

Patent Solicitors.
A. V. Briesen, 258 Broadway, N. Y.....30
Burke & Fraser, 37 Park Row, N. Y.....28
Cox & Cox, 229 Broadway, N. Y.....28
Howson & Son, Phila. and Washington, D. C.....28
Munn & Co., *Scientific American* 37 Park Row N. Y..36
Nye Francis C., 13 Murray, N. Y.....28
Simonds W. E., Hartford, Ct.....28
Spencer A. H., 28 State Boston, Mass.....28
Stetson T. D., 23 Murray, N. Y.....28

Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 17 Murray, N. Y.....9

Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y.....36
Meyer Henry C. & Co., 48 Cliff, N. Y.....40
McNab & Harlin Mfg. Co., 76 John, N. Y.....34
Pancoast & Maule, 227 Pear, Phila.....26

Pipe Threaders, Cutters, &c.
Converse, M. D., 68 Park Place, N. Y.....
Empire Mfg. Co., 38 Gold, N. Y.....26

Pipe, Water and Gas, *Makers of.*
Barr Edward, 78 John, N. Y.....26
Lehigh Bridge and Iron Works, Rochester, N. Y. 18
McKeal John & Sons, Burlington, N. J.....6
National Tube Works Co., 75 William, N. Y.....26
Warren Foundry & Mach. Co., Phillipsburg, N. J.....6
Wood R. D. & Co., 400 Chesnut, Phila.....26

Piston Packing.
Canfield John & Co., 1321 Fairmount Ave., Phila..36

Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass.....16
Mack & Co., Rochester, N. Y.....25
Middletown Tool Co., 18 & 20 Cliff, N. Y.....6

Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass.....16
Mack & Co., Rochester, N. Y.....25
Stanley Rule & Level Co., 35 Chambers, N. Y.....25

Plated Ware
Derby Silver Co., Derby, Ct.....40
Hall, Elton & Co., 75 Chambers, N. Y.....10
Rogers & Bros., 208 Broadway, N. Y.....
Reed & Barton 2 Maiden Lane, N. Y.....33

Plows, Chilled Iron, *Makers of.*
South Bend Iron Works, South Bend, Ind.....16

Plumbago Lubricator.
Joseph Dixon Crucible Co., Jersey City, N. J.....40

Plumbers' Materials, *Manufacturers of*
Baltimore Bell and Brass Works, 53 and 55 Holliday, Baltimore, Md.....12
Everhart Jas. M., Scranton, Pa.....40
Redfield, Bowen & Walworth Co., Chicago, Ill.....26
Carr Wm. S. & Co. 106 Centre, N. Y.....26

Power Hammers, *Makers of.*
Forsaith S. C. & Co., Manchester, N. H.....39

Presses, Power, *Makers of.*
Boomer & Boschert Press Co., Syracuse, N. Y., and 26 Beekman, N. Y.....39
The Stiles & Parker Press Co., Middletown, Ct.....36

Pressure Blowers, *Makers of.*
Wild R. W., 20 Cortlandt, N. Y.....17
Sturtevant B. F., 72 Sudbury, Boston.....36

Pumps, *Makers of.*
Clayton Jas., 11 Water, Brooklyn, N. Y.....5
Douglas W. & B., Middletown, Conn.....7
Rumsey & Co., Seneca Falls, N. Y.....7
Union Mfg. Co., 99 Chambers, N. Y.....7

Pyrometers.
Brown Edward, 311 Walnut, Phila.....18

Railroad and Mining Tools.
Metcalf, Paul & Co., Pittsburgh, Pa.....37

Railroad Supplies.
Duyckinck W. C., 50 and 52 John, N. Y.....8
Jackson & Tyler Baltimore, Md.....37
Rogers H. A., 19 John, N. Y.....25

Rails, Iron or Steel, *Makers of.*
Atlas Bros., Pottsville, Pa.....6
Cambria Iron Co., Johnstown, Pa.....5
Cleveland Rolling Mill Co., Cleveland, O.....6
Griswold John A. & Co., Troy, N. Y.....33
Lackawanna Iron and Coal Co., Scranton, Pa.....5
Milwaukee Iron Co., Milwaukee, Wis.....6

Razor Straps, *Makers of.*
B. F. Badger, Charlestown, Mass.....16

Refrigerators, *Makers of*
Lesley Alex. M., 226 W. 52d st., N. Y.....25

Revolvers.
Tryon E. K., Jr., & Co., 710 N. 2d, Philadelphia.....16

Rivets.
Old Colony Rivet Works 54 Warren, N. Y.....12
Timme's Son Peter, 251 North 6th, Brooklyn, E. D.....4

Road Scrapers, &c., *Makers of.*
Revolving Scraper Co., Columbus, O.....

Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor 16th and Buttonwood, Phila.....36

Rules, *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St.....25
Stephens & Co., Riverton, Ct.....25

Saddlery Hardware, *Makers of*
Sargeant Mfg. Co., Newark, N. J.....12

Sad Irons, *Makers of*
Brooklyn Sad Iron Co., Brooklyn, E. D., N. Y.....17

Safe Deposit Co.
Penna. Warehousing & Safe Deposit Co., Front and Lombard, Philadelphia.....27

Sand and Emery Paper, *Makers of*
Beader, Adamson & Co., 730 Market, Phila.....6

Sash Locks *Makers of.*
Hammond W. S., Lewisberry, Pa.....35

Saws, *Makers of.*
American Saw Co., Trenton, N. J.....10
Atkins E. C. & Co., Indianapolis, Ind.....10
Boynton E. M., 80 Beekman N. Y.....10
Flint J., Rochester, N. Y.....10
Disston Henry & Sons, Phila.....29
James Ohlen, Columbus, O.....10
Peace Harvey W., Williamsburg, N. Y.....10
Spear & Jackson, 100 Chambers, N. Y.....33
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y.....10

Saw Frames, Wood, *Makers of.*
Boynton E. M., 80 Beekman, N. Y.....10
Peace Harvey W., Williamsburg, N. Y.....10

Selves, Metallic. *Makers of*
Mann R. J. & Co., St. Louis, Mo.....34

Seamless Tubes. *Makers of*
Merchant & Co., Phila., Pa.....3

Scales, *Manufacturers of.*
Chattillon John & Sons, 91 Cliff, N. Y.....9
Fairbanks E. and T. & Co., St. Johnsbury Vt.....17
Rienie Bros., 9th near Coates, Phila.....26

Screws, *Makers of.*
Miles F. S., 206 Quarry, Phila.....17

Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y.....4
Fiein Alfred & Co., 96 Chambers, N. Y.....6
Gueutal George & Son, 39 W. 4th, N. Y.....10

Shovels, &c.
Clement & Hawks Mfg. Co., Northampton, Mass.....12
Middleboro Shovel Co., 63 Oliver, Boston.....12
N. Y. Shovel Works (Screening shovels), 1258 Broadway N. Y.....13

Sheet Metal Workers.
East River S. M. Mfg. Co., 288 Pearl, N. Y.....18

Shears, Scissors &c.
R. Heinisch's Sons, 91

PEEKSKILL FIRE BRICK WORKS.
Established 1831.
HORTON & MABIE,
Manufacturers of
Fire Brick of all kinds,
STOVE AND RANGE LININGS
of every description. Linings for Cupola or Foundry Furnaces. Blocks, Tiles, McKenzie Cupola Brick, &c.
FIRE CLAYS, FIRE SAND & FIRE CEMENT.

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FIRE BRICK
of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, ROCKINGHAM WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin Ground Fire Brick, and Diamantine Building Brick.

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Manhattan Fire Brick & Enameled Clay Retort Works,
ADAM WEBER, - - Proprietor.
Office, 633 E. 15th St., N. Y. Clay Retorts, Enameled for Gas Houses; Retorts for burning raw bone and re-burning bone for Bone Black. Fire Bricks, Tiles, Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay Beds at Perth Amboy, N. J.

Brick Presses,

BRICK PRESSES,
For Fire and Red Brick,
PATENT STEAM GEARING
For grinding Clay for Red or Fire Brick, and a kinds of **Brick Machines** in general.
Works, 1819 Germantown Ave., Phila.
GEO. CARNELL.

Oldest and Largest Establishment of the kind in the U. S
F. L. & D. R. CARNELL,
1844 Germantown Avenue, Philadelphia
Manufacturers of Pennsylvania Brick Machine Little Giant Pipe Machine, Fire and Red Brick Presses, Clay Wheels, Tile Machines, Stampers, Grinding Pans. Brick Yards fitted out for running by steam or horse. Heavy and Light Castings. Send for circular.

PERSEVERANCE
Iron Works & Machine Shop.
MARCUS SCHANTZ,
Having established himself in the Iron and Machine Business in Water St., Perth Amboy, is now prepared to execute all orders in machinery, such as STEAM ENGINES, BRICK MACHINES, BRICK PRESSES AND TILING MACHINERY. Also, Steam Fitting, and Iron and Brass Castings, &c., furnished in the shortest time, and in the best and most workmanlike manner.

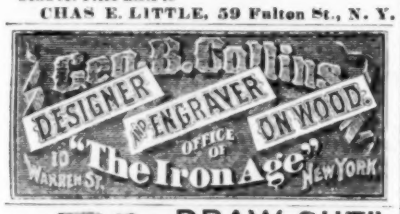
HENRY MAURER,
Late of the firm of MAURER & WEBER.
Proprietor of the
Excelsior Fire Brick & Clay Retort Works,
Sole Manufacturer of French Pat. Roofing Tiles and Hollow Brick.
WORKS: PERTH AMBOY, NEW JERSEY.
Office & Depot: 418 to 422 East 23d St., bet. 1st Ave. and Ave. A, New York.

MILLER'S BRICK PRESSES,
Established, 1844.
Clay Tempering Machines
AND BRICK MAKERS' TOOLS.
Factory, 309 S. 5th Street, Phila. S. P. MILLER

With Disston's Saws. 4 Sizes.

Sold by Hardware Trade.
LANGDON MITRE BOX CO.,
Send for Circular. *Millers Falls, Mass.*

PUMP AUGERS and REAMERS
A SPECIALTY.
1760. 1875.
Solid Cast Steel Pump Auger
A full line always in stock. **Socket Shanks, Ring Handles, and Connecting Rods,** furnished to order.
Send for Price Lists to
CHAS. E. LITTLE, 59 Fulton St., N. Y.



Send for Circular.

DRAW CUT" BUTCHERS' MACHINES.
Choppers, Hand and Power.
Stuffers,
Lard Presses.
Warranted thoroughly made and the BEST IN USE.
MURRAY IRON WORKS,
Burlington, Iowa.

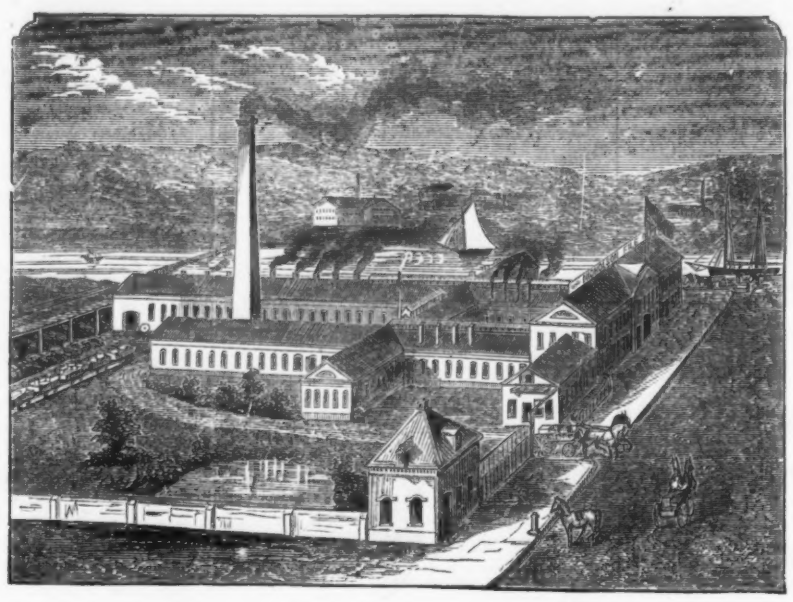
THE TINNERS' FAVORITE.
Olmsted's Patent Lite Improved Combined Setting Down Double Seaming and Deflecting Machine

This machine, so long and favorably known to the trade, has lately been materially improved, and is now presented as a perfect machine; working in X, XX, XXX and XXXX tin, sheet iron and copper, straight, flaring and oval work, such as wash boilers, coffee pots, &c. It is the only machine in use that double seams and sets down without changing the work. Its weight is 101 lbs. and its dies and setting down wheel are made of cast steel. The entire machine and attachments are constructed on a principle that secures its satisfactory operation. It is Warranted. No Tinner can afford to be without it. Price $25. See advertisement in *The Metal Worker*. Send for Circular and Price List to W. L. Hendley, Manufacturer, 35 William St., N. Y. City. Also, Olmsted's Double Seaming and Deflecting Machine, and Waugh's Circular and Squaring Shears.

STAR FIRE BRICK WORKS.
HARBISON & WALKER,
Manufacturers of Benezet and Clarion Brands of FIRE BRICK.

For steel melting holes, Siemens Gas Furnaces, Bessemer Steel Mills, Hearths and Bushes of Blast Furnaces, Fire Box Arches, &c., &c., our Benezet is unequalled. For Rolling Mills, Foundries, Linings and Hot Blasts of Furnaces, Lime Kilns, &c., our Clarion is unsurpassed.
Office and Works, Twenty-Second & Railroad Streets, Pittsburgh, Pa.

Philadelphia Fire Brick AND Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS
Office, 23d and Vine, Philadelphia.
PHILIP NEWKUMET,
Successors to JOHN NEWKUMET, Proprietor
manufactures 9-inch Fire Bricks, Tiles, and Blocks for Rolling Mills, Blast Furnaces, Foundries Gas Works, Lime Kilns, Glass Houses, &c., &c
Articles of every description made to order short notice, and in a very superior manner.
"CLAY RETORTS FOR SUGAR HOUSES."



DEALERS AND CONSUMERS
OF FILES
SHOULD PURCHASE THE
Nicholson or "Increment Cut" File
FOR THE FOLLOWING REASONS:

First.—They are made from the best quality of File Steel.

Second.—Each File undergoes a careful inspection after each operation, by critical inspectors, and none but perfect work allowed to pass.

Third.—They are cut by the **"Increment"** or **irregular cut,** therefore combine the advantages of both Hand and Machine work.

Fourth.—They **will finish finer** than Files of any other make of same degree of coarseness.

Fifth.—They **will not "pin"** or scratch like hand-cut Files.

Sixth.—The **"Increment cut"** File, by our records, **will remove more stock with a given number of pounds applied** than any other File with which we are acquainted

Seventh.—All Files under seven inches are **put up in boxes** of one dozen each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.

Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which **automatically records** the **actual power applied,** forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the **quality of our Steel for wear,** but **also of the cutting qualities** of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.

Finally.—Our Files **are warranted** to be **hard, well cut** and **sound.** They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of **our ability to furnish a good article cheap,** is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

B. KREISCHER & SON.,
New York Fire Brick & STATEN ISLAND CLAY RETORT WORKS,
Established 1845.
Office, 58 Goerck Street, cor. Delancy Street, East River, New York.
The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.
Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

Watson Fire Brick Manufactory
ESTABLISHED 1836.
JOHN R. WATSON, Perth Amboy, New Jersey.
Manufacturer of
FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

NEWTON & CO.,
Successors to
PALMER, NEWTON & CO.,
ALBANY, N. Y., Manufacturers of
FIRE BRICK Stove Linings,
Range and Heater Linings
Cylinder Brick, &c., &c,

M. D. Valentine & Bro
Manufacturers of
FIRE BRICK And Furnace Blocks,
IN ALL ITS BRANCHES.
Woodbridge, - - - N. J.

National Fire Brick & Drain Pipe W'ks,
CHAS. ANNESS & SONS, Props.,
Manufacturers of FIRE BRICK all shapes and sizes.
Miners and Shippers of all kinds of FIRE CLAY.
Factory at SPA SPRINGS, on Perth Amboy and Woodbridge, R. R.
Post Office address, *Woodbridge, N. J.*

TROY STOVE LINING AND Fire-Brick Works.
BELL & BACON.
Stove Linings a Specialty. TROY, N. Y.
JAS. C. BELL, JR. J. BLUNT BACON.

Established 1845.
WOODBRIDGE, N. J.
Fire Brick Works.
WM. H. BERRY & CO.
Manufacturers of all forms and sizes of FIRE BRICK, for Blast Furnaces, Rolling Mills, Gas House and Oven Tiles, and Stove Linings, made to order. Also, Fire Clay, Kaolin, Sand and Fire Mortar.

COX & COX,
Counsellors at Law,
229 Broadway, NEW YORK.
Practice in cases relating to
PATENTS and TRADE MARKS.
Before the
Courts and Patent Office.

A. H. SPENCER,
Solicitor of Patents,
And Expert in Patent Cases.
28 State St., Room 19, Boston.

HOWSONS'
OFFICES FOR PROCURING
UNITED STATES AND FOREIGN
PATENTS,
Forrest Buildings
119 SOUTH FOURTH ST., PHILADELPHIA,
AND MARBLE BUILDINGS
605 Seventh St. (Opposite U. S. Patent Office, *Washington, D. C.*
H. HOWSON, Solicitor of Patents. | C. HOWSON, Attorney at Law.
Communications should be addressed to the PRINCIPAL OFFICES, PHILADELPHIA.

FRANCIS C. NYE,
Counsellor at Law,
13 Murray St., N. Y.
PATENT CASES
brought or defended in any district of the U. S.

SOLICITS W. E. SIMONDS, Att'y at (Patent) Law. **PATENTS**
In the U. S. and abroad, with special aim to strength and validity, and in shortest possible time. Pamphlet free. 345 Main St., Hartford, Conn.

CROOKE & CO.,
MANUFACTURERS OF
WROUGHT IRON BUTTS,
All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.
163 & 165 Mulberry Street, New York.
FERNALD & SISE, Agents, 100 Chambers Street, N. Y.

Burke & Fraser,
SOLICITORS OF
PATENTS
37 PARK ROW, N. Y. CITY.
Established 1851. *Also Consulting Engineers.*

PATENTS. Thomas D. Stetson, No. 23 Murray St., N. Y. Solicitor of Patents, and Scientific Expert in patent cases.
Send for circular.

HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works.

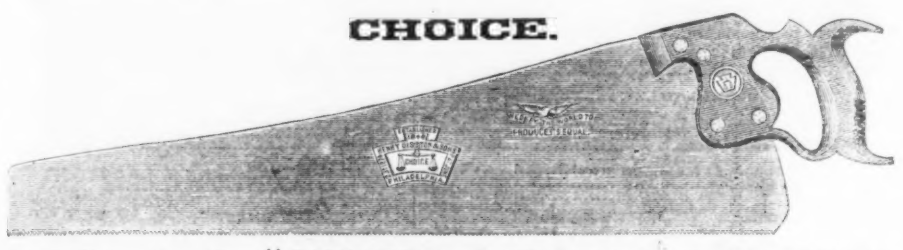
Front and Laurel Streets, Philadelphia.

Our Celebrated CROSS-CUT AND WOOD SAWS.

HENRY DISSTON & SONS'
Patent Skew-back Hand-Saw
NEW No. 7.

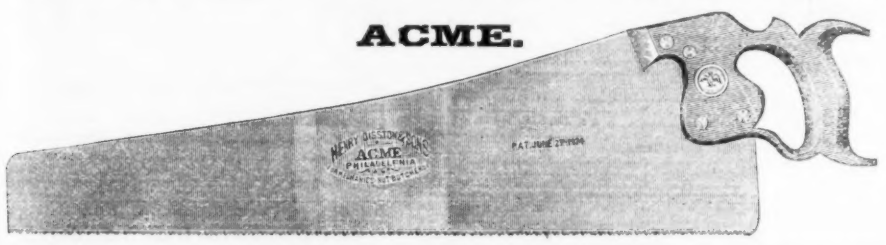
Even in price and quality with our celebrated No. 7 Saw. Warranted to give satisfaction every time.

HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
CHOICE.



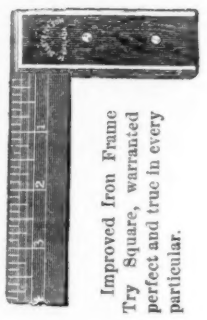
This Saw is the "CHOICE" of all first-class Mechanics who have used it.

HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
ACME.

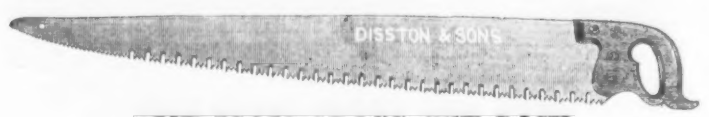


We consider these Saws to be the ACME of perfection. So say all first-class Mechanics who have used them.

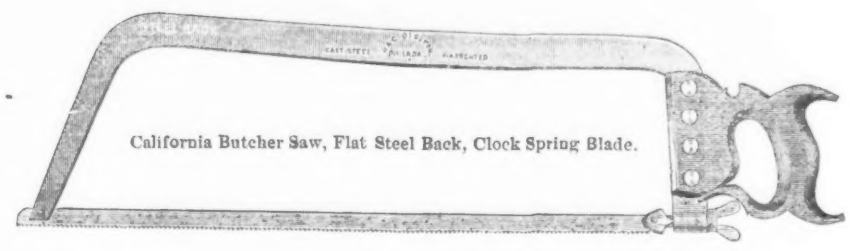
Table Saw.

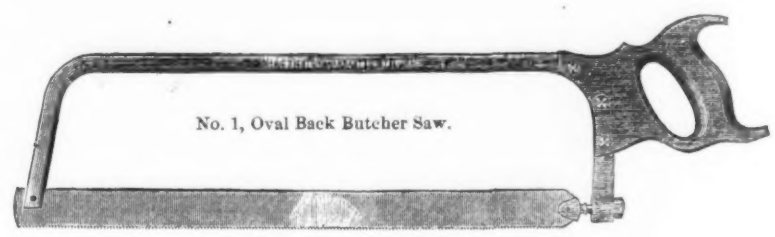


Improved Iron Frame Try Square, warranted perfect and true in every particular.

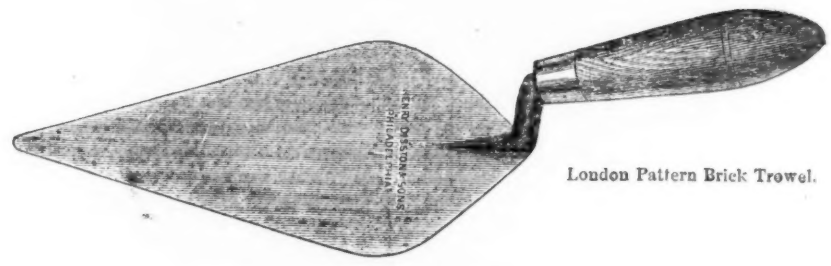


ONE MAN CROSS CUT SAW.





Pork Packers' Saw.



London Pattern Brick Trowel.

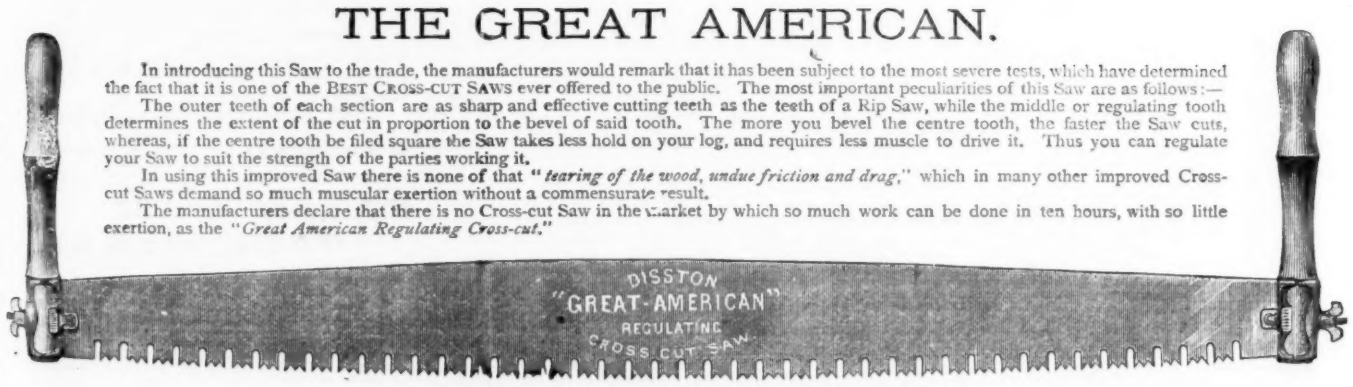
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

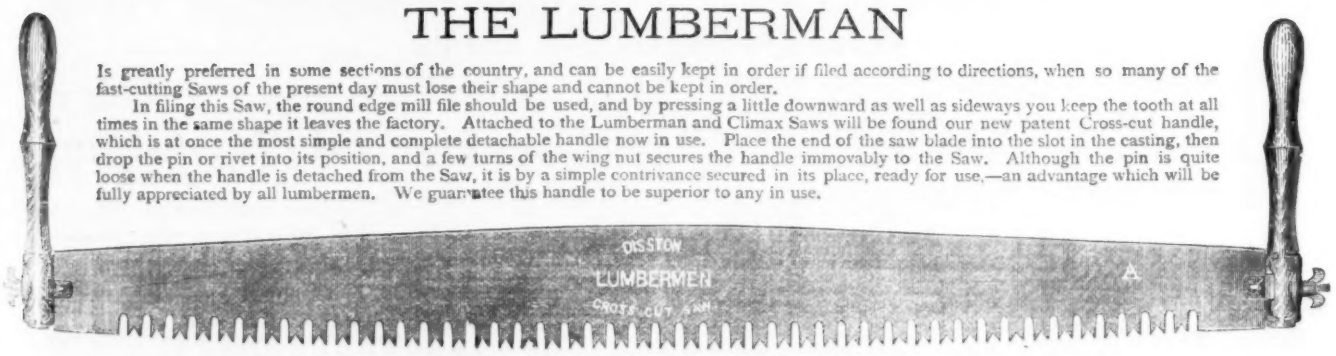
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

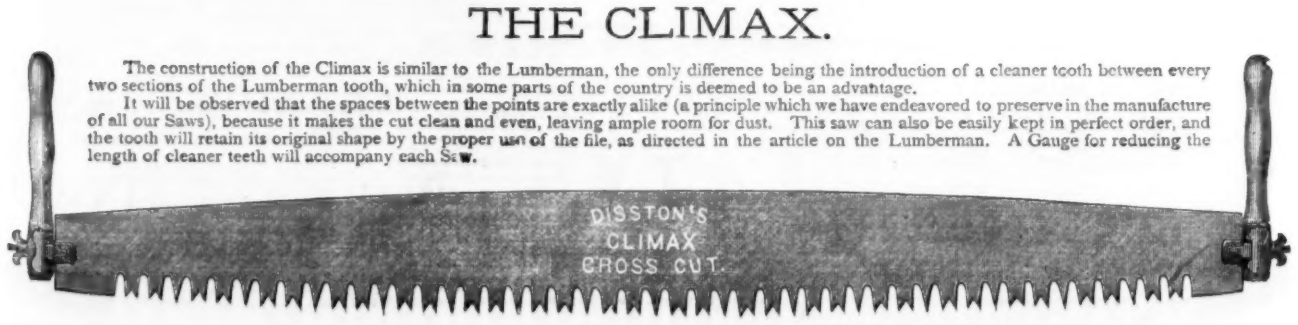
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.

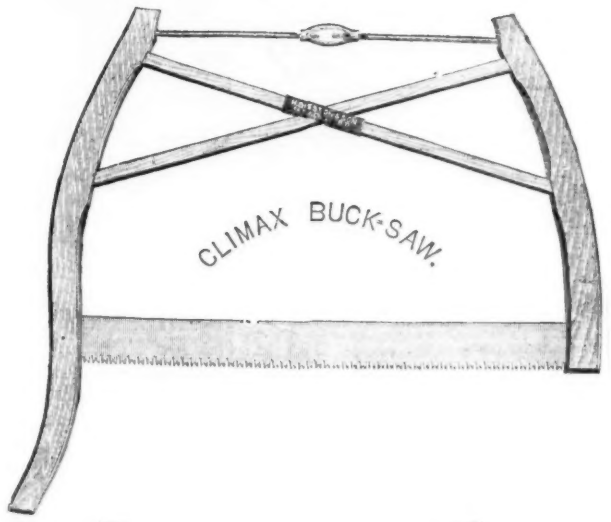


THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.





Plastering Trowel.

New York Wholesale Prices, November 10, 1875.

HARDWARE.

Anvils.
Wright's.....₩ ℔ gold 10½c; over 250 ℔s 11c, gold
Armitage's Mouse Hole.....gold 11c
Wilkinson's.....₩ ℔ gold 11c
Eagle Anvils.....₩ ℔ 8c

Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union, Skeleton Paring, Coring and Slicing.....$3 00 ₩ doz net
Bay State, Paring, Coring and Slicing.....$15 00 dis 10 %
Climax Slicer.....8 00

Ash Sifters.
J. E. Corning's Barrel Head.....dis 10 %

Augers and Bits.
Conn. Valley Mfg. Co., Douglass, Ives, Seechor (French, Swift & Co.), Griswold, Challenge.....1st quality.....dis 40&10 %
Nobles Mfg. Co.....dis 40 @ 40&5 %
Cook's.....dis 40&10&10 %
Diamond Hardware Co.....dis 25&10&10 %
Snell Mfg. Co.....dis 25 %
Jennings' Bits.....dis 10 %
Lewis' Single Twist Bits.....dis 30 %
Andrews' Bits.....dis 25 %
Griswold's Patent Bits.....dis 30 %
Expansive Bits, Clark's, small, $18; large, $26.....dis 15 %
" " Ives'.....$30 @ $36.....dis 30 %
" " Blake's.....$30.....dis 40 %
Hollow Augers, Douglass'.....dis 40 %
" " Ives'.....
" " French, Swift & Co.....
" " Bonney's Adjustable.₩ doz $48.....dis 25 %
" " Stearns' " ..₩ doz $48.....dis 25 %
" " Ives' Expansive.....each $4 50.....dis 40 %
" " Universal Expansive.each $4 50.....dis 10 %
Gimlet Bits—Screw, $7 20; no screw, $9.....dis 20&10 %
Double Cut Gimlet Bits, Shepardson's.....dis 20 %
" " Ct. Valley Mfg. Co..dis 30&10 %
" " Hartwell's.....dis 50 %
" " Douglass'.....dis 25&10 %
" " Ives'.....dis 30 %
Morse's Bit Stock Drills.....dis 20 %
L'Hommedieu's Ship Augers.....dis 20 %
Watrous Ship Augers.....dis 20 %
Vaughan's Post Hole—
6 in. $23 60; 7, 8 and 9 in. $25 per doz.....dis 20 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....per gross $1 20—dis 15 %
" " Best.....per gross $1 60—net
" Shouldered Peg.....per gross $2 25—dis 15 %
" Patent Peg.....per gross $3—dis 15 %
" Shouldered Brad.....per gross $2 25—dis 15 %
Brad Sets, Aiken's.....per doz $14 40—dis 25&10 %
" No. 42, $10 50; No. 43, $12 50.....dis 45&10 %
" Clark's.....dis 40&10 %
" Stanley's Excelsior.....$18 50—dis 25&10 %

Axes.
Brook's.....per doz $12 00 @ 14 00 net
Blood's.....per doz $15 00 @ 16 50—dis 20 %
Hunt's.....₩ doz $12 50 @ 14 00
Collins'.....₩ doz 11 00 @ 15 50 net @ dis 5 %
B. Clark's (J. C. W. & Co.) bron'd or red.₩ doz $10 00 net
Hurd's.....₩ doz 10 50 @ 12 50
Simmons'.....₩ doz 11 00 @ 11 50
Morris'.....₩ doz 12 50 @ 13 50
Red Jacket.....₩ doz 12 00 @ 12 50
Keen's.....₩ doz 11 50 @ 13 00
" Double Bitted.....₩ doz 21 50 @ 22 00
Underhill's.....₩ doz 12 00 @ 13 00
" Crown.....₩ doz 12 50 @ 13 50
John Leverett's.....₩ doz 12 50 @ 15 50
Ten Eyck.....₩ doz $10 50 @ 12 50 net
M. H. Jones & Co.....₩ doz 10 50 @ 11 50 net
Nobles Mfg. Co.....per doz $10 50, net
Elephant.....per doz $10 50 @ 11 00 net

Axle Grease.—Fraser's.....₩ ℔ 6c.

Balances.
Beams.—Plated.....new list dis 50&5 %
Iron Tam.....new list dis 25&5 %
Brass (Plated list).....new list dis 50, 10&5 %
Grocers'.....new list dis 50&5 %

Bells.
Hand, Light Brass.....dis 70&10 %
" Extra Heavy.....dis 40&10 %
" White Metal.....dis 50&10 %
" Silver Chime.....dis 20&10 %
" Swiss.....dis 25 %
" Globe (Cone's Patent).....dis 2&10 %
Gong Abbe's.....dis 20&10 %
" Yankee.....dis 25&10 %
" Barton's.....dis 35 %
Crank, Taylor's.....dis 25 %
" Brook's.....dis 50 %
" Cone's.....dis 10 %
" Connel's.....dis 50&10 %
Lever, Sargent's.....dis 60&10&10 %
" Taylor's.....dis 25 %
" Hart, Bliven & Mead Mfg. Co.....dis 50&10 %
Pull, " " .....dis 50&10 %
" Brook's.....dis 50 %
" Western.....dis 25 %
Call.....dis 15 %
Cow—Common Wrought.....dis 20&10 %
" Western.....dis 20&10 %
" Sargent's.....dis 50&10&10 %
" Kentucky "Star".....dis 20&10 %
" Sargent's.....dis 50&10&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog.
$12 00 10 00 9 00 8 00 6 00 5 00 3 50 2 50 5 00—dis 45 %
" Yaw's Genuine.....dis 35 %
" Texas.....dis 35 @ 40 %

Bellows.
Blacksmiths', Common, List of Sept. 15.....dis 15 %
" Extra and Pittsburgh Pattern.....List net
Moulders'.....dis 30 %
Hand Bellows.....dis 10 %

Blind Adjusters.—Domestic.....₩ doz $3—dis 20 %

Blind Fasteners.
Mackrell's.....dis 30 %
Van Sand's, No. 2000, $14 00; No. 3705, $10 50, net @ dis 5 %
Washburn's Patent.....₩ gross $14 00 dis 5 %
Merriman's.....new list net

Blind Staples.
Boardman's Patent, ⅜ in. and larger.....₩ ℔ 3c
" " ⅝ in.....42 c

Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list.....dis 30 %
Burr's.....dis 10 %
Stanley Rule and Level Co.....dis 25&10 %

Bolts.
Cast Iron Barrel, Shutter, &c.....dis 60&10 %
Cast Iron Chain.....dis 60&10&10 %
Wrought Iron Barrel.....dis 50, 10&10 %
" " Square.....dis 50, 10&10 %
" " Shutter.....dis 60&10 %
Wrought Iron Flush, Stanley's.....dis 15&10 %
" " " Sargent's.....dis 50&10&10 %
Carriage and Tire, Common.....dis 75 %
" " " Norway Iron.....dis 50 %10 %
" " " R. B. & W.....(old list) dis 60 %
" " " Philadelphia.....dis 60&5 %
" " " Shelton's.....(old list) dis 50&10 %
Union Nut Company, old list.....dis 65&5 %
Stove.....dis 25 %
" R. B. & W.....dis 25 %
" Shelton's Shaved Head.....dis 25 %
Borax.....15c. ₩ ℔

Boring Machines.

	Upright.	Angular.
Hoven's, no Augers	$15	$40 net
" with Augers	50	60 net
Douglass', no Augers	35	40 net
" with Augers	50	60 net
Parr's, no Augers	50	75 dis 30 %
" with Augers	75	100 dis 30 %
Kellogg's, no Augers	25	6 75 dis 15 %
Sweets', "	45	6 75 dis 15 %
Snell's, "	45	6 25 dis 20 %
Phillips', with Augers		10 00 dis 25 %

Mortising Machines, $20 00 each.....dis 20 %

Bow Pins.
Union Nut Co.....new list dis 50&10&5 %
Hotchkiss'.....dis 50 @ 55 %
Humason, Beckley & Co.'s.....dis 50&10&5 %
Sargent & Co.'s.....dis 50&10&10 %

Braces.
Barber's Patent.....dis 40&5 %
J. S. Jackus.....dis 40&10 %
Wilson Mfg. Co.....dis 10 %
Pafford's Patent.....dis 50 %
Noble's Patent.....dis 40&5 %
Ives Novelty.....dis 40&7½&10 %
" Hamden.....dis 15&10 %
Common Ball (American).....dis 25 %
Ratchets.—Shelf.....dis 60&10 @ 65&10 %
Bright Wire Goods.....dis 65&10&10 %
Nut Rings.—Union Nut Co.....dis 50&25 %
Serpentine.....dis 60&10 %
Hotchkiss'.....25½ in., $2 25 net

Bung Hole Borers.
Common and Ring.....dis 2&10 %
Ives' Taper Borers.....dis 10&10 @ 25 %
Enterprise Mfg. Co.....dis 20 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co.....dis 20&10 %
Bradley's.....dis 25 %
Beatty's.....dis 20 %

2	3	4	5	6	7	8	9
$26 00	$21 00	$24 00	$27 00	$30 00	$8 50	$36 50	$45 00

Hart Mfg. Co.....dis 12½ %

0	1	2	3	4	5	6
$35 25	$29 75	$34 25	$38 75	$43 25	$48 50	$54 00

Chains.
Wrought Brass.....dis 30 %
Cast Brass.....dis 20 %

Common Cast, not Drilled.

Fast Join't, Narrow.....New list July dis 30&10 %
" Broad.....dis 40&10 %
" " Jap'd.....dis 35&10 %
Loose Joint, Narrow and Broad.....dis 50&10 %
" " Jap'd.....dis 45&10 %
Parliament Butts & Mayer's Hinges.....dis 40&10 %
Loose Pin.....dis 45&10 %
" Japanned.....dis 50&10 %
Loose Pin, Jap'd, Plated Tips.....dis 50&10 %

Drilled and Wired.

Fast Joint, Narrow.....New list July 1, dis 25&10 %
" Broad.....dis 25&10 %
" " Japanned.....dis 30&10 %
Loose Joint.....dis 45&10 %
" Japanned.....dis 45&10 %
Parliament and Mayer's Hinges.....dis 35&10 %
Loose Pin.....dis 40&10 %
" Japanned.....dis 50&10 %
" Plated Tips.....dis 45&10 %
Union Mfg. Co.'s Fancy Butts.—
Figured Enameled Loose Joint.....dis 55&10 %
Nickel Plated " .....dis 33½&10 %
Boston Finish, Plain.....dis 80&5 %
" " with Iron Acorns.....dis 75&5 %
" " with Sil'd " .....dis 65&5 %
Wrought Iron.
Fast Joint, Narrow, Lt. and Regular.....dis 30 %
" Broad.....dis 35 %
Loose Joint, Narrow and Broad.....dis 35 %
Table Butts, Back Flaps, &c.....dis 30 %
Inside Blind, Regular.....dis 30 %
" Light.....dis 40 %
Loose Pin, Wrt.....dis 35 %
Am. Spiral Spring Butt Co., list May 1st.....dis 25 %
Union Spring Hinge Co.....dis 20 %
Blind Butts, Parker.....dis 65&10 %
" Palmer.....dis 40 %
" Seymour.....dis 55&10 %
" Shepard.....dis 60 @ 60&10 %
" Lull & Porter.....dis 60 %
" Nicholson.....dis 45&10 %
" Huffer.....dis 33½&10 %
" Garretson, No. 1.....dis 65 %
" Clark's, Nos. 1, 3 and 5.....dis 65&10 %
" Clark's No. 2.....dis 65&10 %
" " Nos. 2 4, 4½, 6, 8, 10.....dis 65 %

Can Opener.
Messenger's Comet.....per doz $3 00 dis 20 %
American.....per doz 2 25 dis 40 %
Lyman's.....per doz 3 75 dis 20 %
No. 4, French.....per doz 2 25 dis 40 %
No. 5, Iron Handle.....der doz 2 25 dis 40 %
Sprague's.....Nos. 1 2 3 4
Per doz $4 00 4 50 5 00 9 00 dis 55&10 %
Star.....per doz $3 00 dis 2½10 %
Eureka.....per doz $3 50 net
Sardine Scissors.....per doz $7 00 dis 40 %

Caps—Percussion, per 1000.
G. D.....37 @ 40c
Ely's E. B.....1-4s, 55c.; 1-10s, 70c. gold
" Double Waterproof, 1-4s, $1 45; 1-10s, $1 52½c., gold
Colt's.....1-10s 80c gold

Carpet Sweepers.
Union.....each $2 75 net
Welcome.....each 2 75 net

Cartridges.—Metallic.....dis 55&5 %

Carus.—Horse and Curry.....dis 30&10 %
Cotton.....dis 10&10 %
Wool.....dis 15&10 %

Carpet Stretchers.
Cast Steel, Polished.....per doz $5 00 dis 30 %
Cast Iron, Steel Points.....per doz $2 00 dis 45&5 %

Casters.
Bed.....dis 30&10 @ 40 %
Plate and Shallow Socket.....dis 40&10 %
Deep Socket.....dis 35 @ 40 %

Cattle Leaders......new list dis 60&10 %

Chain
English Coil.....net gold

₩ ℔	11¼	8¾	7⅞	7⅜	7⅛	7c
	5-16	⅜	5-16	⅜	7-16	⅜

Trace, 6½-10-2.....by the cask, ₩ pair, gold 55c
Trace, 7-10-2.....by the cask, ₩ pair gold, 62c
German Halter Chain.....dis 25 % gold
German Coil.....dis 25 % gold
Galvanized Pump Chain.....₩ ℔ 18c
Jack Chain, Iron.....dis 50&10 %
" Brass.....dis 40&10 %

Chalk.
White.....₩ gross, 57c net
Red.....₩ gross, 90c net
Blue.....₩ gross, $1 00 net
White Crayons.....₩ gross, 16¼c net

Chisels.
Socket Framing, Douglass, Extra.....dis 60&10&10 %
" " Crossman.....dis 50&15&10 %
" " Buck Bros. equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&10 %
" " Merrill.....dis 60&10 %
" Firmers, Douglass, Extra.....dis 60&10 %
" " Crossman.....dis 50&10&10 %
" " Buck Bros.....equivalent to dis 50&15 %
" " Hart Mfg. Co.....dis 60&5 %
" " Merrill.....dis 60 %
Socket Corner.....dis 40&10 %
Tanged Firmers.....dis 40&10 %
" Butcher's.....$5 50 to £ gold
" Newbould's.....$5 50 to £ gold
" Spear & Jackson's.....$5 50 to £ gold
" Buck Bros (Shank).....$5 50 to £ gold

Clamps.
Iron, Providence Tool Co.'s.....dis 20 %
" Adjustable, Gray's.....dis 20 %
" " Lambert's.....dis 2½ %
" " Snow's.....dis 40&5 %
" " Hammer's.....dis 10 %
" Cabinet.....dis 60&10 %
Saw Clamps.....see vises

Clips, Axle.
Norway or Best.....dis 30 @ 40 %
Superior.....dis 50 @ 55 %

Coal Shovels.
Wrought Iron. Nos. 1 2
Long Wrt. H dles..per gross, $15 00 13 00 dis 25 %
" " " 12 00 14 00 dis 25 %
Wood Handles....." 12 00 14 00 dis 25 %
Gem (Edgar's Pat.)" 15 00 18 00 dis 25 @ 30 %
Cast Iron, Iron Handle.....per doz, 75 @ 80c. net
" Wood Handle.....per doz, $1 00 net

Coal Hods.

Inch.	14	15	16	17	18	
Regular, Jap'd...per doz,	$12 00	12 75	13 50	15 50	18 00	dis 60&10 %
Regular, Gal'd "	15 00	16 00	17 50	19 50	22 50	dis 50&10 %
Ladies' Favorite, Jap'd. ₩ doz	15 00	16 00	18 00	20 00		dis 50 %
Ladies' Favorite, Galvanized ..... "	19 00	20 00	22 00	25 00		dis 45 %

Funnel Hods.—	Nos.	15	16	17	
Oriental, Japanned. ₩ doz.	$16 50	18 00	20 00		dis 50 %
" Galvanized.. "	21 50	22 50	24 00		dis 40 %
Morning Glory, Jap'd. "	16 50	18 00	2 00		dis 50 %
" Gal'd. "	21 00	22 50	24 00		dis 40 %
Iron Clad, Jap'd..... "	21 50				dis 40&10 %
" Gal'd..... "	22 50				dis 50&10 %

Sidney Shepard & Co.'s new list.....dis 10 %

Cockeves......1¼ in., 28c.; 1⅜ in., 33c.; 1¾ in., 87c. net

Cocks.
Brass Racking.....dis 30&10 %
Lock and Globe.....dis 30&10 %
Lever Bibbs.....dis 30&10 %
Ale and Beer.....dis 25&10 %

Coffee Mills.
Board and Box.....dis 15 @ 20 %
Brighton.....dis 20 %
Increase Wilson's.....dis 20 %
Selsor's Fat.....$9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.).....dis 20 %
French Steel.....dis 15 %
The Swift.....dis 20 %

Compasses and Dividers.
Bemis & Call Co.'s.....dis 35&10 %
Cook's.....dis 15 %
Excelsior.....dis 30 %
Peck Stow & Wilcox.....dis 25 %
Miller's Patent.....dis 25&10 %

Coopers' Tools.
Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 20 @ 25 %
Swan & Brombacher.....dis 15 @ 20 %

Corkscrews......dis 25 %

Corn Knives and Cutters.
Bradley's.....dis 10 %

Crow Bars.
Cast Steel.....₩ ℔ 11c. net
Iron, steel points.....₩ ℔ 5c

Crucibles.—Gautier & Co.....₩ No. 5 45c

Curling Irons, &c.
⅛, ⅜, ½ in., $1 80, $2 00, $2 40.....dis 10 %
Curling Tongs.....₩ doz $6 50—dis 15 %
Pinching Irons.....₩ doz 7 50—dis 20 %

Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list.....dis 40 %
Fitch's (List of No 240, $1).....dis 20&10 %
Rubber.....₩ doz, $9 00—dis 15 %
Wood Tooth (Fuller Bros.).....per doz $2 25 net

Curtain Pins.—Silvered Glass.....new list dis 15 %

Cutlery.
American Table } Meriden } New list Jan. '75, dis 25 %
American Pocket } Cutlery Co } .....dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co...dis 20&10 %
Am. Miller Bro.'s Cutlery Co.....dis 25 %
Naugatuck Cutlery Co.....dis 2½ %

Dippers.
Britannia.....per doz 7 50—dis 50 %; by bbl. dis 33½ %
Cocoa, Plain.....per doz $2 25—dis 20 %
" Rimmed.....per doz 3 75—dis 20 %

Dog Collars.
Embossed Gilt.....dis 20 %
Leather.....dis 30 %
Brass.....dis 25 %

Door Springs.
Gem (V.W. & W.), No. 1 Large, Jap'd ..₩ doz $3 50 } dis
" " No. 2 Medium.....₩ doz 2 50 } 10 %
" " No. 3 Small.....₩ doz 2 00 }
Gray's (V.W. & W.).....₩ doz 2 50 net
Torrey's Pattern (V.W. & W.).....₩ doz $2 50 net
Torrey's Patent.....₩ doz $2 50 net
Johnson's.....per doz $3 00 net
Pul adelphia.....5 in., $5 00; 8 in., $7 00 dis 15 %
Palmer's Japanned No. 6.....₩ doz $5 00 }
" Coppered " 6 00 } dis 20 %
" Silvered " 8 00 }
Challenge.—Japanned.....No. 9, per doz $2 00 }
No. 7, " 2 50 } dis 10 %
No. 6, " 3 00 }
Barker's Concealed.....dis 12½ %

Drawing Knives.
Crossman's No. 1.....dis 50&15&10 %
Douglass, Extra.....dis 60&10&10 %
Hart Mfg. Co., No. 1.....dis 60 %
Merrill.....dis 60&10 %
Nobles Mfg. Co.....dis 15 %
Bradley's.....dis 25 %
Adjustable Handle.....dis 15 %

Drills and Drill Stocks.
Blacksmiths'.....each $2 60 net
" Self-Feeding.....each 6 00 net
Breast, P. S. & W.....dis 45 %
" Aiken's.....dis 25&10 %
" Hotchkiss.....dis 10 %
" Wilson's.....dis 10 %
" Miller's Falls.....dis 25 %
Ratchet, Merrill's.....dis 20 %
" Ingersoll's.....dis 35 %
" Whitney's.....dis 20 %
" Weston's.....dis 20 %
" Moore's Triple Action.....dis 20 @ 25 %
Wilson's Drill Stocks.....dis 10 %
Automatic Boring Tools.....each $2 75—dis 20 %

Drill Chucks.—The Danbury..each 10 00, dis 20 @ 25 %
Beach Patent (Morse).....dis 15 %

Egg Beaters.
Monroe's..... 8 in. 10 in.
Per doz $8 00 9 00 .....dis 10 %
Dover.....₩ doz $6 00—dis 10 %
National.....₩ doz $4 50—dis 20 %
Peerless.....₩ doz $7 00—net

Emery.
Genuine Chester—Regular Nos.....₩ ℔ 6c } dis 10 %
" Flour and FF.....₩ ℔ 4c }
Washington Mills—Regular Nos.....₩ ℔ 8c
" Flour.....₩ ℔ 5c

Enameled and Tinned Ware.
Kettles.....dis 30 @ 40 %
Sauce Pans.....dis 25 %
Glue Kettles.....dis 25 %
Tinned Saucepans.....dis 25 %

Escutcheons.
Door Locks.....Same discounts as Door Locks
Brass Turned.....dis 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Frary's Patent Petroleum.....dis 15&10 %
Taylor's Pattern " .....dis 30&10 %
Wood and Metallic.....dis 40 %
Wood, Cork Lined.....dis 6 @ 65&5 %
Enterprise Mfg. Co., Self-Measuring.....dis 20 %

Felloe Plates......₩ ℔ 13c; dis 25&10 %

Files.
American File Co.....$5 00 to £ currency—dis 20 %
Arcade File Works.....$5 00 to £ currency
Auburn File Works.....$5 00 to £ currency
Nicholson.....new list, Jan. 1, 1875, net @ 5 %
Hartford File Co.....$5 50 to £ currency—dis 10 %
L. B. Heller & Co.....$5 00 to £ currency
Heller & Bros.....$5 00 to £ currency
Western".....5 00 to £ net
Wheeler, Clemson & Co.....$5 00 to £ currency
Rothery's.....$5 to £ currency
J. & Riley Carr.....5 25 to £ gold
" " Horse Rasps.....5 50 to £ gold
Stubs'.....$ 50 @ 9 00 to £ gold
Butcher's.....5 25 to £ gold
Walter Spencer & Co.'s "Diamond".....5 00 to £ gold
Spear & Jackson's.....5 00 to £ gold
Jowitt's.....4 50 to £ gold
Newbould's.....5 25 to £ gold
W. K. & C. Peace's "Imperial".....5 25 to £ gold
R. Ibbotson.....5 00 to £ gold
Turton Bros. & Matthews.....$5 50 to £ currency
Fisher's.....4 75 to £ gold
GoodLad's.....4 00 to £ gold
Moss & Gamble.....5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.).....5 00 to £ gold
" " Horse Rasps.....5 25 to £ gold
"Philo Sheffield," P. T. Co.....5 00 to £ gold
Limet & Co. (French).....5 00 to £ gold

Fluting Machines.
Mrs. Coles' Pony..4 in., $4 75; 5 in., $5; 6 in., 5 50; 7 in., $6
Knox with 4-inch Rolls.....3 50 each net
" " 6 " .....4 00 each net
" " 8 " .....6 75 each net
O. K.....6 50 each net
Peerless, 4-inch Rolls.....4 00 each net
" 5 " .....4 75 each net
Excelsior, No. 1.....4 75 each net
" No. 2.....6 50 each net
Diamond.....7 50 each net
Champion, 6 inch rolls.....6 00 each net
" 4 inch rolls.....5 00 each net
Climax 7-inch Rolls.....8 00 each net
" 4½ " .....6 50 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
Defiance.....4 in., $3 50; 6 in., $4 00; 8 in., $6 50 each net
K. F. M., 4½-inch Roll.....5 50 each dis 15 %
" 6-inch Roll.....6 00 each dis 15 %
Myers' Fashion Fluter, 4½ inch Rolls.....2 75 each net
" Convex Brass Fluter, Sad Iron attachment.....per doz $15 00
Domestic Fluter.....$1 50 each net
Geneva Hand Fluter.....$15 00 per doz net

Fluting Scissors......dis 25&10 %

Forges.
"Empire" (W. P. Kellogg & Co.).....dis 20 %

Forks.
Hay, Manure & Spading.....dis 33½ %
Plated A 1.....dis 50 %

Fry Pans.
Burnished, P. S. & W., new list.....dis 50 %
₩ doz.....$2 00 2 75 3 25 4 75 5 25 6 00 7 00 8 00 9 00
No.....0 1 2 3 4 5 6 7 8
Smith, Burns & Co., "Excelsior" Polished.....dis 35 %
₩ doz.....$3 70 4 00 4 70 5 30 6 00 7 00 8 00 9 00
No.....1 2 3 5 6 7 8

Gas Stoves.
Tiff & Howard.....dis 20 %

Gauges.
Marking.....dis 4&10 %
Wire.....dis 10 %
" Smith's Patent.....per doz $18 00, dis 40 %

Gimlets.
Nail and Spike.....dis 25&10 %
Double Cut, Shepardson's.....dis 20 %
" " Hartwell's.....dis 40 %
" " Ives'.....dis 25 %
" " Douglass'.....dis 20&10 %

Glue Pots.
Tinned and Enameled.....dis 25 %
Family, Howe's "Eureka".....dis 25 %
" L. E. & C.'s "Handy".....dis 25 %

Grind Stone Fixtures
Sargent's Patent.....dis 65&10 %
Reading Hardware Co.....dis 10 %
J. F. Green & Bro.....dis 20 %
Hart Mfg. Co.'s.....dis 60&10&10 %
Rice Bros.....dis 4&5 %

Hammers.
Emmet Hammer Co.'s Handled.....dis 25 %
" " Sledge & Stone.₩ ℔ 40c.; dis 40 %
Humason & Beckley Mfg. Co.....dis 16⅔&10 %
Maydole's.....dis 12 %
Cheney's.....net @ dis 5 %
Verree.....dis 5 %
Yerks & Plumb.....dis 20 %
Magnetic Tack.....dis 25&10 %
Warner & Noble's.....dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair..... } dis 20 %
" Leg Irons $6 50 per pair..... }
Providence Tool Co.'s Hand Cuffs. $15 per doz } dis 10 %
" " Leg Irons 25 " }

Handles.
Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz $ 80 1 00 1 18 1 35 1 50—dis 60 %
Roggin's Latches.....40c. @ 50c. net
Bronzed Iron Drop Latches.....per doz $1 20 net
Wrought Chest.....dis 60&10 %
Surface Chest.....dis 65&10&10 %
Flush Chest.....dis 60&10&10 %
Lifting.....dis 60&10 %
Coffin.....dis 50&10 @ 60&10 %
Saw and Plane.....dis 25&10 %
Hammer and Hatchet.....dis 25 %
N. Carolina Handle Co.....dis 15 %
Brad Awl.....per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 2½&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 8 50—dis 2½&10 %
" Framing " " " 7 00—dis 20&10 %
File " " " 4 00—dis 20&10 %
Auger " " " 6 50—dis 20&10 %
" " large " 8 00—dis 20&10 %
Patent Auger, Ives'.....dis 25&10 %
" Douglass'.....per set $1 25—dis 10 %
" Swan's.....per set $1 00—dis 20&10 %

Hangers.
Barn Door.....dis 65&10 %
"Anti-Friction" No. 1, $1 25; No. 2, $1 50 ₩ pr. dis 30&5 %
Novelty.....dis 33 %
Challenge.....dis 40 %

Harness Snaps.
Henshaw's.....dis 25&10 %
Judd's.....dis 40 %
Fitch's (Bristol).....dis 30 %
Hotchkiss'.....dis 10 %
Andrews'.....dis 25 %
Sargent's.....dis 50&10 %
New York Wire.....dis 2½&20 %

Hatchets.—Isaiah Blood.....dis 15 %

Shingling, Nos.	1 2 3.	₩ doz	$7 25	8 00	8 75
Claw, "	1 2 3.	₩ doz	7 75	8 50	9 25
Lathing, "	1 2 3.	₩ doz	7 50	8 00	8 50

Hunt's.....dis 15 %

Shingling, Nos.	1 2 3.	₩ doz	$8 00	8 50	9 00
Claw, "	1 2 3.	₩ doz	9 00	9 50	10 00
Lathing, "	1 2 3.	₩ doz	8 00	8 50	9 00

Newark's Edge Tool Co.'s.....dis 25 %

Shingling, Nos.	1 2 3.	₩ doz	$6 50	7 00	7 50
Claw, "	1 2 3.	₩ doz	7 25	7 75	8 25
Lathing, "	1 2 3.	₩ doz	6 50	7 00	7 50

Yerkes & Plumb.....dis 20 %

Shingling, Nos.	1 2 3.	₩ doz	$7 00	7 50	8 00
Claw, "	1 2 3.	₩ doz	7 50	8 00	8 50
Lathing, "	1 2 3.	₩ doz	7 00	7 50	8 00

Simmon's.....dis 15 %

Shingling, Nos.	0 1 2 3.	₩ doz	$7 50	8 00	8 50	9 00
Claw, "	1 2 3.	₩ doz		9 00	9 50	10 00
Lathing, "	1 2 3.	₩ doz		8 00	8 50	9 00
Broad, "	1 2 3.	₩ doz		9 00	10 00	12 00
" "	4 5 6.	₩ doz		14 00	16 00	18 00
" "	7 8.	₩ doz		20 00	22 00	

Elephant.....dis 30 %

Shingling, Nos.	1 2 3.	₩ doz	$8 00	8 50	9 00
Claw, "	1 2 3.	₩ doz	9 00	9 50	10 00
Lathing, "	1 2 3.	₩ doz	8 00	8 50	9 00

J. P. Verree & Co.....dis 5 %

Shingling, Nos.	1 2 3.	₩ doz	$7 00	7 50	8 00
Claw, "	1 2 3.	₩ doz	7 50	8 00	8 50
Lathing, "	1 2 3.	₩ doz	7 00	7 50	8 00

Underhill's.....dis 10 %

Shingling, Nos.	1 2 3.	₩ doz	7 25	8 00	8 75
Claw, "	1 2 3.	₩ doz	7 75	8 50	9 25
Lathing, "	1 2 3.	₩ doz	12 00	11 00	13 00

M. H. Jones & Co.....dis 25 %

Shingling, Nos.	1 2 3.	₩ doz	$5 00	8 50	9 00
Claw, "	1 2 3.	₩ doz	9 00	9 50	10 00
Lathing, "	1 2 3.	₩ doz	8 00	8 50	9 00

Hay Knives.—"Lightning".....per doz $3 00 net

Hinges.
Gate, Western.....₩ doz $6 25—dis 60&10 %
" N. E.....₩ doz 11 25—dis 6 .&10&10 %
" N. Y. State.....₩ doz 7 20—dis 60&10 %
Rolled Plate.....dis 65&10 %
" Raised.....dis 65&10 %
Wrought Strap and T.....dis 33½&10&5 %
Providence Plate. { 6 and 8 in. 11c ₩ ℔ } dis 30 %
{ over 8 in. 9½c ₩ ℔ }
Screw Hook and Strap. { 8, 10, 12 in. 6¾c } net
{ 14 to 36 in. 5¾c }
Heavy Welded Hook. { 8 to 12 in., 6¾c } net
{ 14 in & up, 6c }
Screw Hook and Eye. { ⅝ to 1 in., 8½c } net
{ ⅜ in. 9½c }
{ ¼ in. 11½c }

Hoes.
Solid Shank, C. S.....₩ doz $8 00—dis 35 %
Socket.....₩ doz 9 00—dis 35 %
Riveted Eye.....₩ doz 5 00—dis 35 %
Grub.....dis 25 %
Planting.....net @ dis 5 %
Scovill.....add 33½ %
Scovill Pattern.....net @ dis 5 %
Lane's C. E. Cresent, American Pattern.....list net
" " Scovill Pattern.....add 10 %

Hooks.
Bird Cage.....dis 60&10 @ 70&10 %
Cotton.....dis 50 %
Belt.....dis 55 @ 60 %
Bench—Hotchkiss' $5 00 ₩ doz.....dis 10 %
" Weston's No. 1, $6 00; No. 2, $7 00 per doz net
" McGill's.....$3 00 per doz, dis 10 %
" Skinner's.....per doz $6 25, dis 30 %

Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling.	Hart's list	dis 60&10&10 %
	Sargent's list	dis 60&5&10 %
	Reading list	dis 35&10 %

Wrought Staples and Hooks and Staples.....dis 70&10 %
Wire Screw Hooks and Eyes.....dis 60&10&10 %
Grass.....dis 2½ %
Whiffletree—Patent.....dis 33½ %
Hooks and Eyes—Malleable Iron.....dis 60&10&10 %
" " Brass.....dis 60&10&10 %

Horse Nails.

Nos.	5	6	7	8	9	10
American Pressed.....₩ ℔	32c	30c	30c	30c	30c	30c
Ausable, "	30c	27c	25c	24c	25c	22c
" P't'd & Pol'd.. "	31c	28c	28c	26c	24c	23c
" " & Blued.. "	32c	29c	27c	26c	25c	24c
Cortland.....dis 40 %"	29c	26c	24c	23c	23c	21c
Buffalo Forged..... "	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd.. "	31c	29c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin.. "	29c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin.... "	30c	27c	25c	24c	23c	22c
Peerless' Pointed and Polished..... "	30c	27c	25c	24c	23c	21c
Perkins' Pointed and Blued..... "	31c	28c	26c	25c	24c	22c
Putnam..... "	32c	28c	26c	25c	24c	23c
Vulcan, P't'

Shears and Scissors.
Cast Steel.....dis 75&10 %
Cast Iron.....New list July 15.....dis 30 %
Heinisch Sons' Trimmers and Scissors.....dis 65 %
" " Standard quality Shears and Trimmers.....dis 40 %
Seymour's Straight Trimmers.....dis 60&10 %
" Scissors.....dis 50 %
Pruning.....per doz $10 00—dis 35 %
Barnard's Lamp Trimmers.....per doz $4 75

Sheaves.
Sliding Door, M. W. & Co. list.....dis 40&5&2 %
" R. & E. list.....dis 50&5&2 %
" Patent Roller.....dis 25 %
" " Hatfield's.....dis 50 %
" Russell's Anti-Friction.....dis 50&2 %
Sliding Shutter, R. & E. List.....dis 50&5&2 %

Shovels and Spades.
Ames.....dis 20 %
Birmingham Shovel Co.....dis 15 %
Rowland's.....dis 25 %
Old Colony.....new list dis 10&5 %
Middleboro' Shovel Co.....new list dis 20 %
C. E. Jennings.....New list dis 30&10 %
Dunning's Shovels and Scoops.....dis 20&7½ %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 50&10&2 %
" Hart's.....dis 55&2&10 %
Polished Steel.....dis 50&10&2 %

Skates.
Barney & Berry's
N. Y. Club.....₱ pair $2 75
B. & B. Club....." 3 50
All Clamp....." 4 25
Rink....." 8 00
} dis 25 %
Florence Steel.....$1 00 dis 25 %
" Spring.....3 00 dis 30 %
" All Clamp.....3 50 dis 30 %
Peck & Snyder's—
No. 1, Blued.....per pair $5 00
No. 2, Nickel Plated.....per pair 6 00
No. 3, " " extra..per pair 8 00
Clipper Club Blued.....per pair 3 50
" " Full Pol'd....per pair 4 50
" " and Nickel Plated.....per pair 6 00
} dis....25 %
Acme Club Skates,—Nos. 3 7 10 12 14
Pair $4 00 5 00 7 00 7 50 8 00 dis 20 %

Slates.
Square Frames, Round Cornered, by case.....dis 65&10 %
Less than a case.....dis 65 %

Spoke Shaves.
Iron.....dis 33⅓&10 %
Wood.....dis 30 %
Bailey's.....dis 20&10 %

Spoke Shave Irons.
Spear & Jackson's.....$5 00 to £ gold

Spoons.
Tinned Iron.....dis 10 %
By the case.....dis 20 %
Basting.....dis 10 %
Britannia.....cl #50&5 @ 55 %
" Boardman's, new list.....dis 55 %
Rogers & Bro., A 1.....dis 50 %
Derby Silver Co.....dis 50 & 5 %
Holmes, Booth & Haydens.....dis 50 %
Nickel Silver Co.....dis 40 %
German Silver.....dis 30 @ 35⅓ %
Tin (P. S. & W.)—
Teas.....$1 50 ₱ gross, net
Tables.....2 75 " net

Stocks and Dies.....dis 5&10 %

Stone.
Hindostan Stone.....₱ ℔ 6c
" Axe Stone.....₱ ℔ 8c } dis 20&10 %
" Slips.....₱ ℔ 10c
Sand Stone.....₱ ℔ 6c—dis 20&10 %
Washita Stone.....No. 1, ₱ ℔ 30c net
" No. 2, ₱ ℔ 25c net
" Slips.....No. 1, ₱ ℔ 60c net
Arkansas Stone.....No. 1, ₱ ℔ $1 35 net
" Slips.....No. 1, ₱ ℔ $2 50 net
Grindstones. Family, J. F. Green & Bro.....dis 20 %
" " Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₱ gross, 6 00
Gem.....₱ gross $4 25 @ 4 50 net
Gold Medal.....₱ gross $6 00 dis 25 %

Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2 50 @ $4 00 ₱ doz net
Try Squares and T Bevels.....dis 45&10 %
Star Try Squares and Bevels.....dis 30 %
Disston's Try Squares No. 1.....dis 20 %
" " No. 2.....dis 40 %
" " Improved.....dis 20 %

Tacks.
Full Weight American Iron.....dis 45&7½ %
Half Weight American Iron.....dis 72½&7½ %
Carpet.....dis 7½ %
Brads American Half Weight.....dis 50&7½ %
Finishing Nails.....½ ⅝ ¾ 1 1¼ in. and over
₱ ℔.....25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout.....½ ⅝ ¾ 1 1¼ in. and over
₱ ℔.....25c 20c 18c 14c 12c dis 7½ %
Copper Tacks.....₱ ℔ 50c—dis 7½ %
Iron Shoe Nails, ₱ ℔ 4-8 and longer, 9½c; 3½-8-10c.....dis 7½ %
Double Pointed.....dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co.....dis 20 %
Eddy's.....dis 20 %

Tea Trays.
American Tea Tray Co.....dis 15 %

Thermometers.
Tin Case.....dis 50&10 %

Toe Calks.
Winsted.....₱ ℔ 18c., dis 10&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20 %
Wood Bottom.....per doz $12—dis 25&10 %
All Iron.....per doz $10 50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W.....dis 10 %

Traps.
Game, Newhouse.....dis 25 %
" Peck, Stow & Wilcox.....dis 30 %
" Hotchkiss.....old list dis 30 %; new list dis 10 %
" Blake's Patent.....dis 30 %
Mouse, Wood Choker.....₱ doz holes. 15 @ 16c
" Patent Chocker Union Nut Co.).....₱ doz holes 16 @ 18c net
" Round, Wire.....₱ doz $1 50 to 2 00 net
" Square, " .....₱ doz 2 00 to 2 50 net
" Cage, " .....₱ doz 2 50, dis 10 %

Trowels.
Lothrop's Brick and Plastering.....dis 10 %
Disston's Brick and Plastering.....dis 12½ %
Rose's Brick.....dis 5 %
Brades' Brick.....gold. dis 10 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 25 %

Triers.
Butter and Cheese.....dis 25 %

Ventilators (Window).
Nickel and Gilt.....per dozen $16 00 @ 18 00

Vises.
Solid Box, Trenton..4) to 160 lbs., 16c.: 160 and over, 20c
" " Wilson's.....30 to 160 lbs., 18c } dl 25 %
160 and over, 22c }
" " Peter Wrights.....16c gold
Parallel, Parker's.....dis 2 %
" Wilson's.....dis 30&10 %
" Sargent's.....dis 55&10 %
" Trenton.....dis 45 %
" Backus and Union.....dis 25 %
" Merrill's.....dis 15 %
" Fisher & Norris.....dis 15& 10 %
" Buffalo.....dis 25 %
" Stevens'.....dis 15 @ 20 %
Saw Filers, Bonney's.....per doz $20 00 dis 20 %
" Stearn's.....per doz $20 00 dis 20 %
" Hopkins'.....per doz $17 50 dis 10 %

Wheel Barrows.
Canal (Pugsley & Chapman).....new list dis 15 %
Coal, Garden and Stone (Pugsley & Chapman).....dis 25 %

Well Wheels.
Revised list.....dis 60&10 %

Wire.
Brass and Copper.....dis 10 %
Bright and Annealed.....Nos. 0 @ 18 dis 45 @ 47½ %
" " " 19 @ 26 dis 50 @ 52½ %
" " " 27 @ 36 dis 55 @ 57½ %
Coppered.....0 @ 18 dis 40 @ 42½ %
Galvanized, Nos. 0 to 9.....₱ ℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18.....market list dis 10 @ 15 %
Tinned.....dis 25 @ 30 %
Cast Steel.....dis 15 @ 20 %
Tinned Broom Wire.....dis 70 @ 35 %
Galvanized Telegraph, Nos. 8 and 9.....₱ ℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11.....₱ ℔ 10c @ 10½c
" " " 12.....₱ ℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9.....dis 47½ @ 50 %
" Grape, " 10 to 14.....dis 47½ @ 50 %
Fence Staples.....₱ ℔ 7½ @ 8 %
Stubs' Steel Wire.....$7 00 to £ gold
Judd's Picture Wire.....dis 50
Clothes Line Wire.....per coil 60c. net

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 30 %
" Diagonal.....dis 20 %
Collins & Co.'s.....dis 45 %
Coes' Genuine.....dis 40&10 %
" Pattern (Wrought).....dis 50&10 %
" (Malleable).....dis 65&10 %
Lindsay's Patent.....dis 25 %
Taft's Pattern.....dis 70&10 %
Davis 'atent Duplex.....new list dis 25 %
Bemis & Call's Patent Combination.....dis 20&5 %
" Merrick's Pattern.....dis 25&2½ %
" Brigg's Patent.....dis 15&10 %
Aiken's Pocket (Bright).....per doz $10 00—dis 50&10 %

Wringers.	Less than 2 doz	2 doz lots
Providence	₱ doz $72 00	$70 00
Reliance	₱ doz 69 00	67 00
Universal—Extra	₱ doz 72 00	70 00
Novelty	₱ doz 72 00	70 00
Sherman	₱ doz 72 00	70 00
Eureka	₱ doz 60 00	58 00
Wringers without Cog Wheel	₱ doz 60 00	58 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 10 %.
COMMON STAMPED WARE, 4C.

Bucket Covers.

Quarts	½	1	2	3	4
Inch	4¾	5 3-16	6 5-16	6¾	7 11-16
Per gross	$2 00	2 60	3 40	4 25	5 75
Quarts	6	8	10	12	
Inch	8⅝	9¼	9¾	10 9-16	
Per gross	$6 50	8 00	9 50	11 50	

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11¾	12¾	13¾
Per gross	$15 00	18 00	22 00

Pot Covers.

Inch	7¾	8¼	8¾	9¼	9¾	10¼
Per gross	$5 75	6 00	6 25	6 75	7 25	8 25
Inch	10¾	11¾	11¾	12¼	12¾	13¼
Per gross	$8 75	9 50	10 00	13 00	13 75	16 50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4 00	4 50	5 50	5 50	8 50	10 50

Deep Pie Plates.

Inch	9	10
Per gross	$8 50	10 50

Jelly Cake Pans.

Inch	9	10
Per gross	$7 50	10 00

Coffee Pot Covers.

Plain	1¼	2	3	4	5	6 qts.
Inch	3	3⅜	3¾	4¼	5	
Per gross	$1 15	1 40	1 60	2 00	2 75	3 00
Rimmed	2¾	3	3⅜	4	4½	inches.
Per gross	$2 25	2 50	3 00	3 50	4 00	

T. K. Breasts only.

Inch	7¾	8	8½	9	9½	10	10½	1½
Per gro.	$6 00	6 50	6 75	7 25	7 75	9 50	10 00	12 00 13 00

Grater Plates.

Sheet	½	1
Per gross	$5 00	6 00 11 50

Scolloped Cake Pans.

	Small.	Large.
Per gross	$7 50	11 50
Without Tubes	per gross, $8 00	11 50
With Tubes	" 10 50	14 00

Stamped Square Pans.

No	½
Per gross	$7 50 14 50

Common Square Pans (One Sheet).

Per gross	$11 50

Milk Skimmers (Plain or Pierced).

Per gross	$4 00

Lettered Plates

Inch	5½	6
Per gross	$3 25	4 00

Steamer Bottoms.

Add $1 per gross, or 10c. per doz. to list of Pot Covers.

Tin Stove Pipe Rings.

Inch	4	4¾	5	5½	6	7
Plain	per gro. $4 00	4 50	5 00	5 50	6 00	7 00
Jap'd or Burn'd	" 6 00	6 50	7 00	8 00	9 50	10 00

Coffee Boiler Lips.

	Small.	Large.
To Rivet	per gross, $0 85	1 10
To Solder	" 1 25	

STAMPED DEEP AND RETINNED WARE.
Discount 20&10 %.

Plain Stamped Water Dippers.

	½ pint.	Pint.	Quart.	quarts.	2½ quarts.
Per doz	90	1 15	1 50	1 85	2 50

Retinned Milk Pans.

Qts	½	1	1½	2	3	4	5	6	8	10	12
₱ doz	1 20	1 50	1 75	2 00	2 25	3 15	3 50	3 85	4 75	5 25	5 75

Dipper Bowls, Plain Stamped—

Pints	½	1	Quarts	1	2	2½
Per doz	60	75	Per doz	1 00	1 25	1 75

Dipper Bowls Retinned—

Pints	½	1	Quarts	1	2	2½
Per doz	75	95	1 05	Per doz	1 40	1 75 2 25

Pans.

Dish Pans, Retinned Deep—							
Quarts	7	8	10	14	17	21	30
Per doz	8 50	9 50	11 00	13 00	16 00	19 00	30 00

JAPANNED TIN WARE, dis 5 %.

Canisters, Common	Pound	¼	1	2	3
	Per gross	$10 50	15 00	24 00	30 00
Canisters, Hinged	Pound	1	1½	2	3 4
	Per gross	$19 00	25 00	32 00	37 00 42 00
Canisters, Square	Pound	2	4	6	8 12 16
	Per doz	$3 00	4 25	5 00	5 75 8 00 9 00
Candlesticks, Japanned	No.	1	2		
	Per gross	$8 00	7 00		
Cake Boxes, Round	per nest,	$7 25			
Square	per nest,	4 25			
Chamber Pails, Japanned	Nos.	2	3	4	5
Green, per doz		$8 00	9 00	11 00	18 00
Oak "		$8 00	11 00	12 00	13 50
Dust Pans, Corrugated	per gross,	$22 00			
Box Graters	per gross,	$3 75			
Molasses Cups	Pint	½	1	2	4
	Per gross	$15 00	16 00	28 00	42 00

Lunch Boxes, per doz.....7 in. $2 00; 8 in. $2 50
Pepper Boxes Japanned..₱ gross small, $3 00; large, $4 00
Toy Banks, House.....No. 1 2
Per gross $7 00 5 50
Toy Banks, Gothic.....No. 1, $6 00, No. 2, 4 00 per gross
Toy Cups, Straight.....No. 1 2 3
Per gross $3 75 3 25 2 75
Toy Cups, Flaring.....No. 1, $4 25; 2, $3 75 ₱ gross
Toy Pails, Covered.....No. 1, per gross $4 00
Toy Rattles.....per gross, $2 00
Trunks, Wire Handled.....per nest (5) $17 75
Spittoons, Tin.....per gross, $27

PLANISHED TIN WARE, dis 20 %

Tea Pot Handles—P. S. & W.....dis 20 %

Stow's Patent Hollow Tea Pot Handles.

No. 1, Small, 4½ inches.....per gross, $11 50
No. 2, Medium, 5¾ " " 12 50
No. 3, Large, 6½ " " 13 50
No. 4, Ex. Large 7¼ in., for Wash Pitchers &c....." 18 00

Solid iron. Tin Tipped.

No. 10, Small, 4¾ inches.....per gross, $9 00
No. 15, Medium, 5¾ " " 9 50
No. 20, Large, 6¾ " " 10 75

Stow's Patent Hollow Tea Pot Handles, Adamantine bronze—P. S. & W

No. 12, Bronzed and Tin-Tipped.....per gross, $13 50

Cuspan Handles, Of best Malleable iron.
P. S. & W.....dis 20 %

No. 1, 5¼ inches long	Japanned	per gross,	$3 50
No. 2, 6	"	"	3 75
No. 3, 6½	"	"	4 00
No. 4, 7¼	"	"	4 25
No. 5, 8	"	"	4 50
No. 6, 9	"	"	4 75

Tinned.

No. 1, 5¼ inches long		per gross,	$4 25
No. 2, 6	"	"	4 50
No. 3, 6½	"	"	4 75
No. 4, 7¼	"	"	5 25
No. 5, 8	"	"	5 50
No. 6, 9	"	"	5 75
Japanned		per lb.,	16
Tinned		"	20

Iron Kettle Ears (P. S. & W.).....dis 45 %
Half gross pairs in a package.

Tinned

Nos.	1	2	3	4	5	6	7	8
Per gross pairs	85c	1 00	1 50	1 75	2 10	2 75	3 75	4 50

Black.

Nos.	1	2	3	4	5	6	7	8
Per gross pairs	75c	88c	$1 35	1 50	1 75	2 25	2 75	4 00

Tinned Tea Kettle Ears.

Nos.	4	5	6
Per gross pairs	$1 75	2 10	2 75

Extra Heavy Tinned Kettle Ears—French Pattern.

Nos.	1	2	3	4	5	6	7
Per gross pairs	$1 00	1 25	1 50	1 75	2 00	2 50	3 00

Malleable Iron Kettle Ears for Coal Hods, &c.
P., S. & W.....dis 20 %

No. 10 Small	₱ ℔.	Tinned 24c;	Black, 16c
No. 20 Medium	₱ ℔,	" 20c;	" 16c
No. 30 Large	₱ ℔,	" 20c;	" 16c
No. 40 Extra Large	₱ ℔,	" 20c;	" 16c

In cases of 100 lbs. each.

Milk Can or Boiler Handles—(P. S. & W.) 4½ in..dis 25 %
Plain, 8c.; Japn'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned.....30c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.).....dis 35 %
Plain with drilled holes, per lb.....8c
Plain with Cast " " 8c
Plumbers' Scrapers—(P. S. & W).....dis 25 %
Extra quality, length 6 in., per doz.....$4 00

METALS.

IRON.—DUTY Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¾ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1	₱ ton,	$24 00 @
Foundry No. 2	"	23 00 @
Gray Forge	"	20 00 @ 22 00

SCOTCH.

Coltness	"	32 50 @ 33 00
Glengarnock	"	32 00
Gartsherrie	"	32 50
Eglinton	"	29 50 @ 30 00
Summerlee	"	

Bar Iron.
Am. Renned, at mill.....2·4c. @ 2·5c

Rails.
American, at works, currency.....₱ ton 45 00 @ 50 00
Old Rails....." 25 00 @ 26 00

Scrap.
Wrought Scrap....." 31 00 @ 32 00

Bar Iron from Store.

Common Iron.

⅜ to 2 in. round and square	₱ ton	$37 50	
to 6 in. x ⅜ to 1 in.			

Refined Iron.

⅜ to 2 in round and square	"	57 50 @	60 00
1 to 6 in. x ⅜ to 1 in.	"	62 50 @	65 00
1 to 6 in. x ¾ and 5-16	"	62 50 @	65 00
Shafting Iron—2¾ to 4 in.	"	62 50 @	75 50
Rods—5-16 to ⅝ round and square	"	110 00 @	65 00
Bands	"	70 00 @	72 50
Hoops—⅝ to 2 in.	"	130 00 @	80 00

Swedish Iron.

Ordinary sizes	"	120 00 @ 122 50
Plow size	"	

Sheet Iron.

Nos.	Common American and English.	R. G. American.	R. G. English.
10 to 20	₱ ℔ 4c	5c	5¼c
21 to 24	" 4¼c	5¼c	5½c
25 to 26	" 4¾c	5¾c	5¾c
27	" 4¾c	5¾c	6c
28	" 5c	5c	6¼c

Galvanized, 14 to 20, prime, ₱ ℔ 8¼c; 2d quality ₱ ℔ 7½c
" 21 to 24 " " 9¼c " " 8¼c
" 25 to 26 " " 10 c " " 9 c
" 27 " " 10¾c " " 9¾c
" 28 " " 11⅝c " " 10½c

Patent Polished.....₱ ℔ 14c
Russia, Nos. 8 to 16....." 15¼c
" Stained, No. 1....." 14¼c
Belgian.....10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

⅝	5	5⅛	6	7	inch.
$2 50	3 50	4 50	5 25	6 50	per doz.

RUSSIA IRON.

4½	5	5½	6	7	inch.
$5 00	7 00	9 50	12 00	14 00	per doz.

COPPER—DUTY. Pig, Bar and Ingot, 5c.; old copper, 4 cents ₱ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot.....₱ ℔ 23¼ @ 23½c
English " .....

SHEATHING, BRAZIERS COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot.....31c. ₱ ℔
Braziers Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....33c. "
Braziers' Copper, 12 oz. per square foot.....35c. "
Circles less than 24 inch in diameter.....34c ₱ ℔
Circles, 24 inch diameter and over.....35c. "
Segment and Pattern Sheets.....34c. "
Locomotive Fire Box Sheets.....31c. ₱ ℔
Sheathing Copper, over 12 oz. per sq. ft.....30c. "
" " 12 oz. ₱ sq. ft. and lighter.....35c. "
Bolt Copper.....31c. "
Copper Bottoms, 33c. ₱ ℔.....net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.

14x48.

14 and 16 oz. and heavier	37c.	By the case,	36c. ₱ ℔
12 oz. and lighter	40c.	" "	39c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60

14 and 16 oz. and heavier	38c.	By the case,	38c. ₱ ℔

(And all sizes not over 20 inches wide.)
50x60

14 and 16 oz. and heavier	41c.	₱ ℔
12 oz	44c.	"

TINNING.

14x48, by the case	8c.	₱ sheet
14x48, less than case	10c.	"
Other sizes not larger than 30x60	2½c.	₱ sq.
Larger than 30x60	5c.	"

Brass

Brown & Sharp's Gauge the Standard except for Fine Wire.

BRASS MANUFACTURERS' PRICE LIST.

October 27th, 1875.

Net cash prices for Roll and Sheet Brass, Wire, &c., for quantities of 100 pounds and over at one time. For less than 100 pounds, three cents additional.

HIGH BRASS

All Nos. to No. 28, and widths 14 in. and under.....27c
All Nos. to No. 24, inclusive, and widths over 14 to 20 in., inclusive.....30c
Over 20 in. to 30 in., inclusive.....33c
⅛c. ₱ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at.....45c
Sheets 24x48 in. and all sheets cut to particular sizes and lengths.....33c
Printers' Rules.....40c
Sheets wider than 30 in and under 40 in.....40c
" " " 40 in. and over.....42c
Circular sheets, in diam. from 4 in. to 14 inclusive....37c
" " " " over 14 " 30, " 40c
" " " " 20 " 30, " 43c
" " " " 30 " 40, " 46c
" " " " 40 in.....49c

LOW BRASS.

Four cents ₱ ℔ more than High Brass.
Gilding Metal, 7c, ₱ ℔ more than High Brass.
Platers' or Gold Metal { In Bars.....42c; Sawed.....45c; Planed or Polished.....48c

FOR SLITTING.

Metal, in width 2 in. to ⅛ in. to No. 30, inclusive, 1c. per ℔. advance.
Metal, in width 2 in. to 1 in., thinner than No. 30, 2c. per ℔. advance.
Metal, in width 1 in. to ⅛ thinner than No. 30, 3c. per ℔. advance.
Metal, in width ⅛ in. to ¼, to No. 30, 2c. per ℔. advance.
Metal, in width ⅛ in. to ¼ thinner than No. 30, 5c. per ℔. advance.
Metal, ¼ in. in width and less, 10c. per lb. advance.

GERMAN SILVER MARKET METAL AND WIRE.

4 per cent., 12 in., to No. 26	Market Metal.	Wire.
	$0 80	$0 80
6 " " "	90	90
10 " " "	1 00	1 10
15 " " "	1 00	1 35
18 " " "	1 10	1 50
20 " " "	1 20	

German Silver Sheets over 12 in. wide, and weighing more than 10 lbs., $2 per ℔., net.
Advance 2c. for each additional in., in width above 12 in., and 2c. per ℔. on each No. thinner than Nos. 26 to 36 inclusive.
All German Silver thinner than No. 36 is Platers', at 50c. per ℔. additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Cop'r.
Nos. 0 to 20	0·30	0·34	0·40
Nos. 21, 22, 23	0·31	0·35	0·42
Nos. 24 and 25	0·32	0·36	0·43
Brass Rods, No. 8 and larger	0·36	0·40	0·46
Wire straightened and cut, smaller than No. 8	0·40	0·44	0·50

Fancy Wire not less than 4 cents per pound advance of Round Wire.
Spring Wire, 2 cts. per lb. advance.

FINE WIRE, BY THE OLD ENGLISH FINE WIRE GAUGE.

	High Brass.	Low Brass.	Gild'g and Cop'r.
No. 26	0·41	0·45	0·51
No. 27	0·44	0·48	0·54
No. 28	0·46	0·50	0·56
No. 29	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·78	0·82	1·15
No. 37	0·98	0·98	1·28
No. 38	1·28	1·28	1·58

Ten cents per pound extra for Spooling.

TUBING.

	₱ ℔
Plain to No. 20 inclusive, above ⅜ in. to 1⅛ in.	$ 44
" 1¼ to 3 in. inclusive	38
" above 3 in.	50

Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.

Plain ⅜ inch	50
" 5-16 "	60
" ¼ "	80
" 3-16 "	1 20
" ⅛ "	1 60

All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing, 4 cents advance on List above Plain.
English, Scotch and Extra Patterns Fancy Tubing to No. 20, 9 cents above Plain.
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under two feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance

ZINC TUBING.

Plain	25
Fancy	31
Scotch and Extra Patterns	34

GERMAN SILVER TUBING.

4 Per cent	85
6 "	95
9 "	1 10
12 "	1 25
15 "	1 40
16 "	1 45
18 "	1 55
20 "	1 65

MISCELLANEOUS.

Common Plain Brass Pail Ears	39
Hose Pipes, 500 and over	71
" under 500	76
Door Rail	40

SCRAP.

High Brass Scrap, 16 cents.
Low " 13 cents.
Gilding, 20 cents.
Turnings, Filings and Chips, half the price of Scrap.

Orders for Goods on this list received on or after this date, will be filled at the rate herein stated.
Terms—Net cash. No discount allowed. Interest to be added after thirty days.

LEAD—DUTY: Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.

Spanish	7c gold
German Refined	6¾c gold
English	6¾ @ 7c gold
American	6¾ @ 6¾c gold
Bar	dis 10 %.....8¾c.
Pipe	dis 10 %.....9¾c.
Tin Lined Pipe	dis 10 %.....10¾c.
Sheet	dis 10 %.....9¾c.
Shot	dis 10 %. Drop, 9¾c. Buck. 10¾c.

BABBITT METAL.

N. P. U	₱ ℔ 8¾ @ 9c
A., 25c.; B, 20c.; C, 15c.; D, 12c.	₱ ℔.

SOLDER.....No. 1, 15c.; No. 2, 14c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 3¾ cents per lb. and 10 % ad val. Railway Bars 4¾ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Machinery (round and square)	10 @ 11c
File	11c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₱ ℔ 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₱ ℔ 12c and upward
Machinery	₱ ℔ 14c
Hammer	" 15c.
Gun or Homogeneous	" 16c

English Steel, payable in gold, net.

Best Cast	₱ ℔ 17½c
Extra Cast	" 14½c
Round Machinery, Cast	₱ ℔ 10¼ @ 11½c
Swaged, Cast	" 19½c
Best Double Shear	" 17½c
Blister, 1st quality	" 14½c
" 2d quality	" 13 c
German Steel, Best	" 11½c
do 2d quality	" 10½c
3d quality	" 9½c
Sheet Cast Steel, 1st quality	" 11½c
" " 2d quality	" 14½c
" " 3d quality	" 12½c
File Steel, Flat and ½ Round	" 12½c
" Square and Round	" 12½c
" Mill	" 13½c
" Taper to 4 inch	" 16c
" Taper 5 and 3¼ inch	" 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.

Silesian, cash	6¼ @ 7c., gold
American "	7¼ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.

Banca	₱ ℔ 24 @ 24¼c., gold
Straits	₱ ℔ 23 @ 23½c., gold
English	₱ ℔ 20 @ 20¼c., gold

TIN PLATES, CURRENCY PRICES.

I C 10x14, Prime Charcoal		9 @ 9·50
12x12, "		9·50 @ 10·00
14x20, "		9·75 @ 10·25
I X 10x14, "		11·25 @ 11·75
12x12, "		11·75 @ 12·25
14x20, "		12·25 @ 12·75
D C 12½x17 "		8·50 @ 9·00
D X 12½x17 "		10·75 @ 11·25
For each additional X add		·2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$

Steel.

THREE CLASS PRIZE MEDALS, CLASSES 1, 21, 22, First Exhibition of Industry LONDON, 1851.

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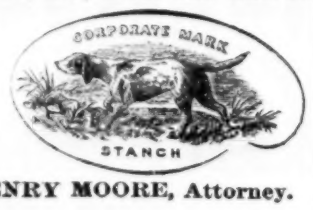

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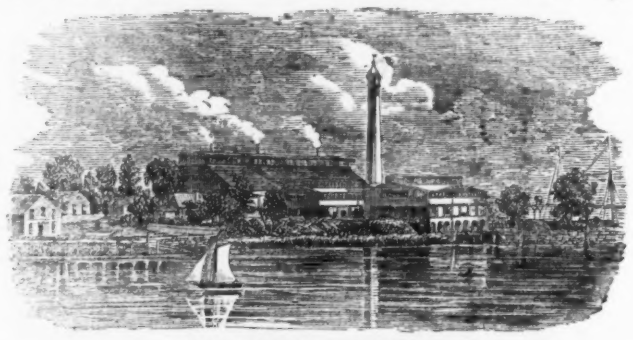

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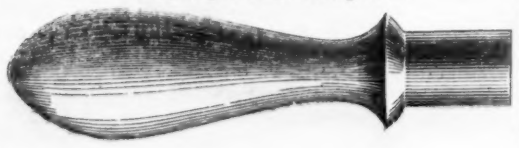

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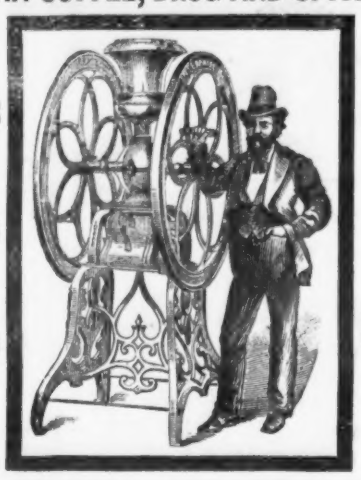

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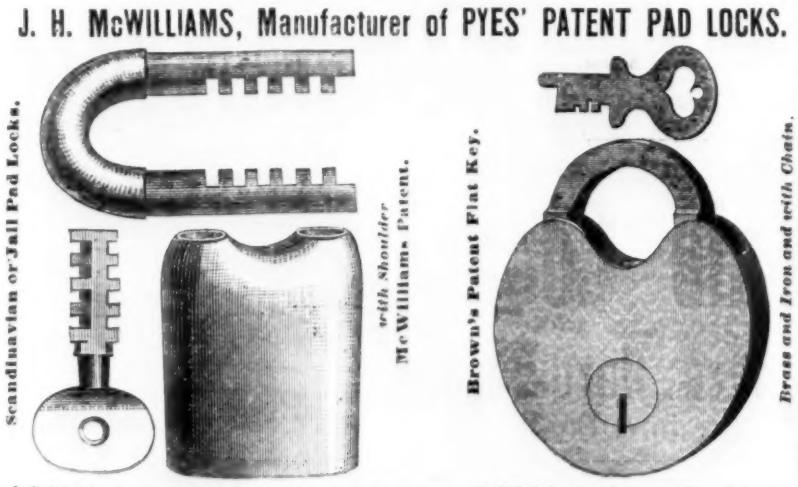

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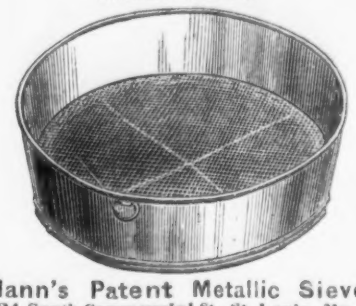

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TACKS, BRADS, NAILS AND

RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d, 2d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

FLUTING MACHINES.

The Celebrated K. F. M.

Manufactured for the Trade by

HENRY SOMMER,

8 to 12 Pearl Street, NEWARK, N. J.

Established in 1836.

Shelton Company,

Manufacturers of every variety of

TACKS & SMALL NAILS,

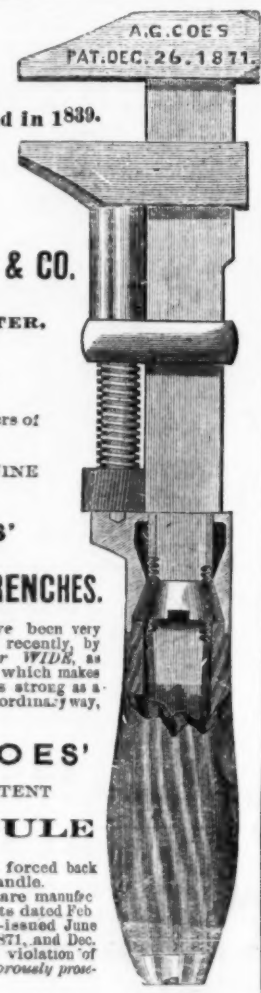
Carriage, Machine, Plow, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.

BIRMINGHAM, CONN

It is the most convenient, durable, safe and reliable Snap ever used. It is easily operated with glove or mitten on. It has a brass coil spring that is four times as long as any other coil spring snap, which will neither rust nor be affected by cold, like steel springs in common use. It is enclosed in the barrel back of the bolt, making a snap which works freely under all circumstances, and without danger of having its parts broken or disarranged. We manufacture all sizes of Harness Snaps and Round Eye Snaps, and Covert's Patent Thimble to go on rope for Cattle and Horse Ties. Also other goods. Send for price list and circulars.

HOLD BACK & SNAP CO., Troy, N.Y.

Established in 1839.



A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

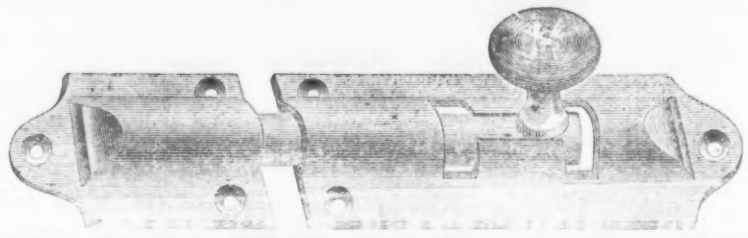
The Hart, Bliven & Mead Mfg. Co.,

18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.

Factories at KENSINGTON, CONN.

MANUFACTURERS OF

Builders' Brass Hardware.



CAST BRASS DOOR BOLTS, CHAIN BOLTS.

Cupboard Catches,

SHUTTER BARS, STORE DOOR HANDLES, &c.,

In great variety.

Our Catalogue and Appendix is now ready. Price $4·50 and charge remitted on receipt of subsequent orders.

J. CLARK WILSON & CO.,

P. O. BOX 2355.

81 Beekman Street, New York.

Northampton Skate Co.,

SHEFFIELD STEEL CLUB SKATES.

THE BEST IN THE WORLD.

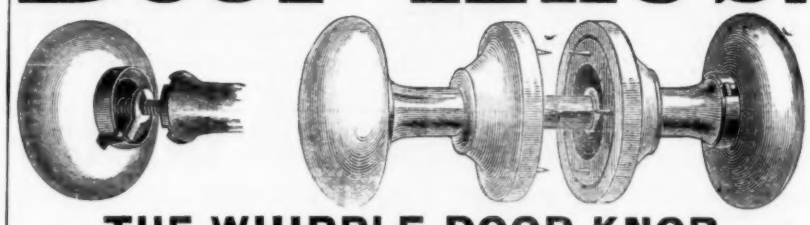
No Buckle to break. NO STRAPS to stop Circulation.

SELF-FASTENING.

FOR SALE BY ALL HARDWARE DEALERS.

WIHPPLE'S PATENT

Door Knob.



THE WHIPPLE DOOR KNOB

Is the only perfect Door Knob Attachment ever invented.

AWARDED A BRONZE MEDAL

At the American Institute Fair, in New York, for 1874.

NO SCREWS USED IN NECK OR ROSES.

Adjusts Perfectly to Doors of Different Thicknesses

WITHOUT THE USE OF RINGS.

The attention of Architects, Builders and Carpenters is specially desired. Circulars fully describing the advantages of this Knob, with Price List, sent on application to

The Parker & Whipple Co.,

WEST MERIDEN, CONN.,

Or 97 CHAMBERS STREET NEW YORK.

CAPEWELL'S

GIANT NAIL PULLER.

Saves Boxes, Nails and Labor.

Sold by all House Furnishing and Hardware Jobbers.

MALTBY, CURTISS & CO.,

MANUFACTURERS,

34 Reade Street, New York

General Agents for CAPEWELL'S LITTLE GIANT TACK HAMMER.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 0 per cent. per annum.

Anvils.—Solid Cast Steel.....₩ ℔ 14c
Peter Wright's, (Advanced April 1st.) ₩ ℔, gold, 11½c
Wilkinson's " " 11c
Eagle.....list 11 cents—dis 20 @ 20&10 %
Apple Parers.—Union.....per doz $7 00
Victor..... " 7 75
Domestic..... " 7 75
Reading..... " 7 75
Bay State Paring, Coring and Slicing..... " 15 00
" " Peach Parers..... " 10 50
10 doz. lots 50c. per dozen discount.
Axes.—Mann's Light.....Per doz. $12 00 @ 11 50
Hunt's Light..... " 14 00 @ 12 50
Red Indian, all sizes..... " 12 00 @ 11 50
Red Chiertain, all sizes..... " 12 50 @ 12 00
Crown Prince..... " 12 50 @ 12 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits.....dis 30 %
Douglass' & Ives' Bits.....dis 40&10 %
Connecticut Valley Auger Bits.....dis 40&10 %
Cook's Bits.....dis 40 10&10 %
Jennings' Bits.....dis 10 %
Bates' Nut Augers.....dis 40&10 %
Douglass' & Ives' Augers.....dis 40&10 %
Watrous' Ship Augers.....dis 10&15 %
Bonner's Pat. Hollow Augers.....dis 25 %
Stearns' Patent Hollow Augers.....dis 25 %
Balances.—
Landers, Frary & Clark's..... } Sold on Morton's new
Morton's..... } List.....dis 50 %
Chattillon's..... }
Common Spring with Hook..... ₩ doz $1 38 @ 2 00
Bells.—Irevin Bros. Mfg. Co. Light Hand Bells.....dis 70 %
Common (Tissue Paper Weight).....dis 70&10 %
Swiss Pattern Hand Bells.....dis 50 %
Connell's Door Bells.....dis 50&5 @ 50&10 %
Gt. Western & Kentucky Cow.. dis 50&10 @ 50 10&5 %
Boring Machines.—Bates' Mfg. Co., complete with augers.....dis 20 @ 25 %
Douglas Mfg. Co., complete with augers..dis 20 @ 25 %
Common Boring Machines, no Augers.....$4 00 @ 3 75
Augusar..... " 5 00 @ 4 75
Bolts.—Eastern Carriage Bolts.....dis 75 %
Western " " .....dis 75 %
Philadelphia " " .....dis 60 %
" Eagle. (Coleman's).....dis 60 %
Wrought Shutter, Stanley.....dis 50 @ 50&10 %
Braces.—Barber's.....dis 40&5 %
Rackus.....dis50 %
Bartholomew's American Ball.....dis 10&10 @ 15&10 %
Spofford's.....dis 50 %
Butts.—Cast Fast Joint, Narrow...dis 25&10 @ 30&10 %
" " Broad.....dis 35&10 @ 40&10 %
Cast Fast Loose Joint.....dis 45&10 @ 50&10 %
" Acorn, Loose Pin.....dis 4 0&10 @ 45&10 %
" Mayers & Parliament.....dis 35&10 @ 40&10 %
" Acorn Jap'd.....dis 45&10 @ 50&10 %
Wrought Loose Pin.....dis 35 %
" Table Hinges and Back Flaps.....dis 30 %
" Narrow.....dis 30 %
" Loose Joint.....dis 35 %
Parker's Blind Butts..... } Discount 60 %; by the case
Sheperd's " ..... } 60&10%.
Garretson's " .....
Clark's " .....
Lull & Porter's Hinges....dis 60 %; by the case, 60&5 %
Garretson's Blind Butts Light No. 0.... } Discount 60 %
" " Lull & Porter Pattern } By the case
Cherrytree Blind Butts..... } 60&10 %
Chains.—German Halter.....dis 20 %
" Coil.....dis 20 %
Galvanized Pump..... net 13 @ 13½c
Best Proof Coil Chain—

₩ ft.	14	10½	9½	9	8¾	8½	8c gold
	5-16	¼	5-16	⅜	7-16	¼	⅝ in.

By the cask, 560 lbs., ½c per lb. less Common Chain, ¼c per lb. less.
Chisels.—Socket Framing.....dis 60 @ 60&10 %
Socket Firmer.....dis 60 @ 60&10 %
Tang " .....dis 40&10 @ 50 %
Beatty's Framing and Firmer.....dis 2 %
Casters.—Iron Beg.....dis 50&10 @ 40 %
Porcelain Wheel Bed.....dis 40&10 @ 50 %
Iron and Brass Wheel Plate.....dis 40 @ 40&10 %
Porcelain Wheel " .....dis 50 @ 50&10 %
Clothes Wringers.—Universal.....per doz $72 00
Novelty..... " 72 00
Discount on 2 dozen lots. $2 per dozen.
Coffee Mills.—Common Box and Side.....dis 15 %
Patent Box and Side.....dis 15 %
Cutlery.—American Pocket (best).....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co.'s.....dis 60 %
Adjustable Handle.....dis 10 @ 15 %
Beatty.....dis 15 @ 20 %
Fry Pans.
Tinned.....dis 40 @ 45 %

₩ doz.	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No.	0	1	2	3	4	5	6	7	8

Burnished.....dis 40 @ 45 %

₩ doz.	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list
" Bastard..... "
" Taper..... "
Butcher's Mill (Advanced March 8th)...$5 25 to £ gold
" Bastard..... 5 25 to £ gold
" Taper..... 5 25 to £ gold
Fluting Machines.
K. F. M.—4½ in. rolls, $5 50.....dis 15 %
" —6 in. rolls, $6 50.....dis 15 %
Mrs Knox—4 in. rolls, $5 75.....dis 20 %
" —6 in. rolls, 7 00.....dis 40 %
Hammers.
Yerkes & Plumb's.....dis 15 %
Hammond & Son's.....dis 15 %
Veree.....dis 20 %
Hatchets.
Beatty's.....dis 15 @ 20 %
Shingling and Half. { ₩ doz. $7 00 7 50 7 75 8 00 / No. 1 2 3 }
Yerkes & Plumb.....dis 15 %
Shingling and Half. { ₩ doz. $7 00 7 50 8 00 8 50 / No. 1 2 3 4 }
Claw..... { ₩ doz. $7 00 8 00 / No. 1 2 3 }
Hinges.
Strap and T. (Changed March 24).....dis 45 %
Horse Nails.

	Nos.	6	7	8	9	10
Ausable		27	25	24	23	22
Globe		24	26	25	24	23
Brundage		26	24	23	22	21
	Nos.	5	6	7	8	9	10
Putnam		32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 40 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 40 %
Extra discount for cash 2 %
Scandinavian Pad Locks.
₩ doz.....$10 50 10 50 12 00 12 00 15 00 15 00 } dis 15 %
No..... 9 9½ 10 10½ 11 11½ }
₩ doz.....$18 00 18 00 22 00 22 00 } dis 15 %
No..... 12 12½ 13 13½ }
Trunk Locks.....dis 5 @ 10 %
Thumb and Rodgers Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil..... " 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½ @ 62½&10 %
Lincoln's " .....dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum.....dis 15&10 %
Taylor's Petroleum Faucets.....dis 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 20 %
Woodruff.....dis 20 %
Stowe's.....dis 20 %
Hale's.....dis 35 %
Stuffers.....dis 20 %
Planes.—Auburn Tool Co., "Bench".....dis 40 %
Second Quality.....dis 50 %
Metallic Plane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 60, 10&10 %
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Rules.....dis 60, 10&10 @ 70 %
Rakes.—Cast Steel Garden.....dis 40 @ 40&5 %
Malleable Garden.....dis 40 @ 40&5 %
Wood Head Iron Teeth.....dis 40 %
Steelyards.—American Pattern.....dis 15 %

₩ doz.	$5 50	7 00	9 00	10 00	11 00	12 00
No.	50	100	150	200	250	300

English Pattern.....dis 15 %

₩ doz.	$7 00	9 67	10 67	12 67	14 67	16 67
No.	50	100	150	200	250	300

L. F. & C. Excelsior.....dis 10 %

₩ doz.	$9 00	10 00	12 00	15 00	1 [illegible]	21 00
No.	50	100	150	"	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $10 00 net
Golden Clipper No. 10, Boxed and Sharpened.....₩ doz $9 75 net
Green Clipper No. 8, Boxed and Sharpened.....₩ doz $9 50 net
Common Scythes.....₩ doz $7 50 @ 9 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Cross Cut.....dis 15 %
Disston's Hand.....dis 12½ %
W. McNiece's Hd. Cross-Cut & Circ'r, new list.dis 15 %
Boynton's Lightning, new list.....dis 40 %
" Champion.....dis 45 %
Shovels and Spades.
Rowland's Plain Back, Jan. 23d.....dis 40 %
" Back Strap " .....dis 40 %
Oliver Ames & Sons.....dis 20 %
Brady Shovel Co.....dis 20&5 %
Sad Irons.—Richmond (polished face).....per lb. 8½c
Richmond (polished face)..... by the cask " 8¼c
Stone.—Arkansas Oil, No. 1..... ₩ ℔ $
Turkey Oil, No. 1..... "
Wasnita Extra..... net " 9½c
" No. 1..... net " 80c
" " 2..... net " 45c
..... " 5¼c
Screws.—Iron.....new list, Sept. 1st, 1875, dis 30 %
Brass.....dis 30 %
Spoons.—
Plated.....dis 40&10 @ 50 %
Britannia, Boardmans (new list).....dis 50&10 %
" Parkers (old list).....dis 50 @ 50&10 %
German Silver.....dis 30 %
" Light.....new list dis 35 %
Lalance & Grosjean Iron.....dis 10 %
Springs.—Gray's Door.....dis 60&10 %
Torry's Door.....dis 60&10%
Stocks and Dies......dis 10&5 %
Stove Polish.—Gem.....₩ gross, $5 00
Onyx..... " 5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 72½ %
" " by the case...dis 72½&7½ %
Clout and Finishing Nails.....7½ %
" " " by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation " " " .....dis 30 %
Vises.—Solid Box, currency.....₩ ℔ net 14c
Wrenches.—Coes Genuine.....dis 40 @ 40&5 %
Coes Imitation Wrought Bar.....dis 50&10 %
" " Malleable Bar.....dis 60&10 %
" " Kellogg Malleable Bar.....dis 65&10 %
Tafts Pattern (Wrought Bar).....dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " " Improved Baxter.....dis 25 %
" " " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....(Advanced April 24th)..dis 42½ %
No. 19 to 26..... " " .....dis 47½ %
No. 27 to 36..... " " .....dis 52½ %
Coppered 6 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 35 %
Galvanized Wire No. 1 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
November 6, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Axes—Francis.....1 50
Bits, Auger—Snell Mfg. Co.....dis 25 %
Phœnix.....dis 40 %
Bells, Cow—Yaw's Genuine.....dis 25 %
Braces—Bit, Spofford's Patent.....dis 50 %
Brads, Cut.....dis 50&7½ %
Boards—Stove, Brooks' Pat. dis 35 % 4 mos.; 35&5 % 30 dys
Belting—Rubber.....dis 30 @ 10 %
Leather, new list, oak tanned.....dis 20 %
Brick—Bath (box of 2 doz) Best English.....$1 25
" Ratherford.....$1 00
Can Openers—Sprague's.....dis 50 %
Cases—Parlor Coal Hod.....dis 15 %
Chalk—White, Carpenter's.....₩ gross, 57c
Red, Carpenter's.....90c
Chisels—Firmer Sockets.....dis 60, 10&10 %
Framing Socket.....dis 60, 10&10 %
Corner Socket Chisels.....dis 60, 10&10 %
Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable.....₩ ℔ 9½c
Cutters—Meat, "Wiley".....35 %
Egg Beaters—"Peerless".....per doz $2 00
"Centripetal".....per doz 5 00
Elbows—Corrugated.....dis 10 %
Adjustable.....dis 20 %
Files—Maischoss Bros.....dis 50 %
Fluters—Geneva Hand.....₩ doz. $15 00
Freezers Ice Cream—"Champion".....dis 33½ %
Hammers—Henry W. Kip's.....dis 10 %
Hinges, Gate—Shepard's.....dis 30&10 %
Hinges—Window Blind—
Shepard's and Standard.....dis 60, 10&5 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized..... " dis 15 %
Fancy and Helmet..... " dis 15 %
Sad Irons.....3½c
Kettles—Brass.....₩ ℔ 45c
Copper, "Hand Made".....38c. @ 40c.
Enameled.....dis 50&10 %
Knives, Drawing—Oval No. 1.....dis 60, 10&10 %
Razor Blade.....dis 60&10 %
Lanterns "Peerless."...No. 1 5 10
₩ doz $26 00 $10 50 $13 75 dis 10 %
Tuquiar.....$11 00
" with Guards.....$11 00
Machines—Apple Paring, "Keystone".....7 75 ₩ doz
Machines—Boring, Snell's.....dis 20 %
Mills, Coffee—Box and Side, common.....dis 15 %
Box Union and Eagle.....dis 15 %
"American".....dis 20 %
Molasses Gates—"Self Measuring".....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Cut, "Chesapeake," 1st.....$3 10
Horse, Ausable.....No. 5 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished.....add 1c ₩ ℔
" " 1000 lbs.....dis 5 %
" Clinton.....No. 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....dis 30 @ 10 %
Paint—White Lead, U. S. Gov't.....₩ ℔ 8½c
Pans—Dripping.....₩ ℔ 10c
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Screws—"American Screw Co"—
Flat Head, Iron.....dis 30%
Flat Head, Brass.....dis 30 %
Sieves—Wood, Hoop Iron.....$1 35
Tinned.....$1 75
Skates and Straps—White's.....dis 30 %
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 50 %
Britannia.....dis 50&10 %
G. S. Hall, Elton & Co.....dis 30&5 %
Squares—Steel and Iron.....new list 50 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₩ gross, $4 50
" Dixon's.....6 00
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Tea Trays.....dis. 15 %
Tools—Machinists' and Tinmens'.....dis 10 %
Vases—Palace Coal.....dis 15 %
Vises—
Parallel, Buffalo...Old pattern, dis. 30%; new, do. dis 20 %
Ware—French, Tinned and Iron.....dis 20&10 %
Stamped and Japanned.....dis 10 %
Cast Iron Hollow.....dis 10 %
Wire—Bessemer Steel.....dis 10 %
Tin Plates.—Add for each X.....2 50
10x14, IC. Charcoal...$9 50 | 14x20 U. terne.....$9 75
12x12, " ...10 00 | 20x28 C. " 19 50
12½x17, " ...9 00 | 20x28 X. " 24 00
14x20, " ...10 50 |
Pig Tin—Straits.....25c @ 26c
Bar Tin.....27c
Solder—No. 1, Crook's.....18 c
Sheet Zinc—
"Lasalle".....570 100 ℔ casks
$10 50 10 80 ₩ 100 ℔s
Sheets.....$10 50
Babbitt Metal.....₩ ℔ 12c
Iron Wire—Bright and Annealed.....dis 45 %
Coppered.....dis 40 %
Tinned.....dis 25 %
Tinned Broom, Nos. 20 21 22 ...dis 33 %
20c 21c 21c
Copper—Sheathing 14 @ 15 oz.....₩ ℔ 30c
Planished.....₩ ℔ 37c @ 39c
Bottoms.....₩ ℔ 32c
Bolts.....₩ ℔ 31 @ 33c
Braziers' Sheets.....₩ ℔ 31 @ 33c
Sheet Iron.—
18 Common.....$4 05
24 Common.....4 25
26 Common.....4 45
24 W. D. Wood & Co., Smooth Finish.....5 25
Planished..... A. B.
14c 11c
Gen. Russia, No. 1 stained.....16c
" " clean.....15c
Galvanized.....dis 33½ %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.
November 1, 1875.

Tin Plate.—I. C. 10x14 Charcoal.....$9 50 @ 10 00
I. X. 10x14 Charcoal.....12 00 @ 12 50
I. C. Terne 14x20.....8 75 @ 9 25
I. C. Terne 20x28.....20 50 @ 21 00
I. C. 20 inches Continuous.....21 00
Block Tin.—
Pig.....₩ ℔ 28c
Bars.....₩ ℔ 26c
Solder.—
A I.....₩ ℔ 16c
Roofing.....₩ ℔ 17c
S. & Co.....₩ ℔ 19c
Lead.—Pig.....₩ ℔ 7½c.
Bar.....₩ ℔ 8½c
Copper.—
Ingot.....₩ ℔ @ 24c
Plantanet..... " @ 38c
Sheathing..... " @ 34c
Copper Drops..... " @ 34c
Sheets, 6 to 7 lb..... " @ 37c
" 8 to 9 lb..... " @ 36c
" 10 to 12 oz..... " @ 35c
" 13 lb. up..... " @ 34c
Copper Bottoms..... " @ 32c
Zinc. Cast, 500 to 1000 lbs.....₩ ℔ 10¼ @ 10¾c
Case, 100 lbs..... " 10¾ @ 11 c
Slab..... " 7½c
Brass.—Roll, No. 6 to 30.....₩ ℔ 30c
Roll, No. 30 to 38..... " 35c
Wire, No. 0 to 20..... " 35c
" 20 to 25..... " 40c
Babbit Metal.—Sellew & Co..... " 35c
Aliens'..... " 20c
Market..... " 17c
Antimony.....₩ ℔ 17c
Bismuth.....₩ ℔ $4 00
Nickel.....₩ ℔ $3 50
Russia Iron.—Bundle.....₩ ℔ 16c
Less than bundle.....₩ ℔ 18c
No. Stained.....₩ ℔ 15c @ 16c
Sheet Iron.

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20	4c	5 10c	7 10
22 to 24	4 30c	5 30c	6 90
26	4c	5 50c	7 05
27	4 20c	5 4c	7¼
30	5¼c		

Galvanized Iron.—Full bundles.....dis 30 %

Nos.	18 to 20	12c	No.	26	14c
	22 to 24	13c		27	15c

Bar Steel.—Silver, ₩ ℔ 16c Crescent, 21c. dis 33 %
Iron Wire.....
Enameled Ware.....dis 50 %
One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₩ doz $2 50	4½ inch.....	₩ doz $5 00
5 "	" 3 50	5 "	" 7 00
5½ "	" 4 50	5½ "	" 7 50
6 "	" 5 00	6 "	" 12 00
7 "	" 6 50	7 "	" 14 00

Lender Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₩ doz.		₩ doz.
2-inch	$1 75	2½-inch	$2 75
3-inch	2 25	3½-inch	3 25
4-inch	2 50	4½-inch	3 50

Sheet Iron Bread Pans.....₩ ℔ 8½c
American Broilers.....₩ doz. $13 50
Tinmen's Machines.....dis 5 %
Sad Irons.—I X L's.....₩ ℔, 3½c
Brass Kettles.—Ansonia.....45c
Dog Irons.....8 c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, specifications to include Bands, small Rounds and Ovals, 2½c. rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4 1c ₩ ℔ net
Iron Wedges.....4½c ₩ ℔ net
Norway Nail Rods.....8½c ₩ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....4½c ₩ ℔ net
Beetle Rings.....8 c ₩ ℔ net
Fence Pickets—
¾ round, bent to shape, 25c ₩ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts.....75 % off net
Carriage and Tire Bolts delivered on cars or boats in Pittsburgh.....
Stove Bolts.....20 % off net
Machine and Square Head Bolts.....40&10 % off net
Coach and Lag Screws.....40&10 % off net
Bolt Ends.....40 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in.....8½c ₩ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6½c ₩ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in.....9½c ₩ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in.....7½c ₩ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ₩ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₩ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ₩ ℔ ex. net prices.
Standard Caps, for Plows.....5¼c. ₩ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 3¼c ₩ ℔ net; ⅞ in. diam. 3½c ₩ ℔ net; ¾ in. diam. 3¾c ₩ ℔ net.
Patent Headed Harrow Teeth, packed in boxes ½c ₩ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5c ₩ ℔ net; 9-16 in. diam. 6c ₩ ℔ net; ½ in. diam. 7c ₩ ℔ net. 1c ₩ ℔ extra when less than 1 keg of each size is ordered.
Strap & T Hinges...31½&10 % off net, delivery as custo'ry
Screw Hitching Rings.....$5 25 ₩ 100 net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long.....₩ ℔ 3¼c net
1 to 2 in. diam. from 4 to 8 ft. long.....4 c net
1 to 2 in. diam. from 1½ to 4 ft. long.....4¼c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long.....4¼c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long.....5 c net
Bridge bolts with upset ends.....¼c. ₩ ℔ extra
Wrought iron plates, punched.....4¼c. ₩ ℔ net
Cast Iron Washers.....₩ ℔ 3¼c net
Duck Nest Tuyere Irons.....$14 50 ₩ doz net

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at Screw End, ₩ set of 8 bolts..45c
12 " ½ " " 8 " ..55c
10 " 9-16 " " 8 " ..65c
12 " 9-16 " " 8 " ..70c
14 " 9-16 " " 8 " ..80c
10 " ⅝ " " 8 " ..80c
12 " ⅝ " " 8 " ..90c
14 " ⅝ " " 8 " ..1 00
16 " ⅝ " " 8 " ..1 10
18 " ⅝ " " 8 " ..1 10
20 " ⅝ " " 8 " ..1 20
5c ₩ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....15c
" " wide track, each.....17c
Single Tree Irons, ₩ set of four pieces.....30c
Wrought Iron Bolster Plates, 2½ in. wide, ₩ set.....45c
" " 3 " " " 50c
" " 3½ " " " 55c
" " 3½ " " " 60c
Wagon Brake Ratchets, each.....14 c
" " finished with guard, each..40 c
Wrought Hammer Straps, heavy pattern, each.....13 c
" " light " each.....12 c
" Rub Irons, each.....9 c
Stay Chain Hooks, each.....5½c
Double and Single Tree Clips, figure 1, each.....8 c
" " " " 2, each.....9 c
" " " " 3, each.....11 c
Axle Clips, Round Part ⅝, Flat Part 1¼, each.....8c
Wagon Clevis, including Pin, complete, each.....10c
Pole Caps, each.....24c
Single Tree Hooks, Nos. 1 and 2.....4½c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks, Clevis and Pin, Clips, Single Tree Hooks, and Pole Caps, in lots of 50 sets.....dis 15 %
Wagon Box Staples, 1½ to 2½ in. to clinch. ₩ 1000 $11 00 net
" " " Bevel Box Iron, to rivet on. ₩ 1000 7 50 net
Neck Yoke Eyes, each.....4½c net
" " with ⅝ rings, each.....7½c net
King Bolts, ⅝, 1, 1⅛, and 1¼ in. diam.....₩ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steepie head, ½ in. diam. all lengths.....4 5½c net
Wagon Rivets, 3-16 in. diam., all lengths.....4 9½c net
" ⅜ to 1 inch long.....₩ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes.....4 1c extra
" in 25 ℔ wood " .....4 ½c extra
Wagon and Hinge Nails, ¼ in.....₩ ℔ 17 c net
" 3-16 in.....4 19 c net
Wagon Rivets and Nails, in less lots than one keg each size.....4 ½c extra
Double Tree Plates.....4 5c net
Coupling.....4 5c net
Tongue.....4 8½c net
Neck Yoke Plates.....4 10½c net
Tongue Cap Iron, 1¾, 2 & 2¾ in. wide, same price ₩ ℔ as Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ₩ ℔ 10½c net. ¼ in., 11½c. net
Above prices are free on board cars in Pittsburgh. Subject to change of market, without notice.

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(Reported by Messrs. Jewett & Root.)
August 30, 1875.

Tin Plate.—Best Charcoal

IC. 10x14	$10 25
IX. 10x14	13 00
XX. 10x14	15 75
IC. 12x12	10 75
IX. 12x12	13 50
IC. 14x20	11 25
IX. 14x20	14 00
XX. 14x20	16 75
XXX. 14x20	19 50
XXXX. 14x20	22 25
DC. 100 Plate	9 75
DX. "	12 50
DXX. "	15 25
DXXX "	18 00
DXXXX 100 Plate	20 75
IX. 14x14	21 50
IC. 10x14 W	9 75
IX. 10x14 W	12 50

Roofing Tin.—Best Char.

IC. Terne, 14x20	$ 9 50
IX. " 14x20	12 25
IC. Terne, 20x28	20 00
IX. " 20x28	45 00

Coke Tin.—

IC. 10x14 Coke	$ 9 25
IX. 10x14, Coke	12 00
IC, 14x20, "	16 25

Solder.—No. 1.....16c
No. 2.....15c

Pig Tin.—

Large Pigs	24c
Small Pigs	25c
Bars	26c

Bright Wire.
63 lbs. in bdl.....dis —
Copper.—
Sheathing.....31c
Copper Bottoms.....32c
Planished Copper.—
Sheathing, 14x48.....36c
Boiler Size, No. 7.....40c
" " No. 8.....40c
" " No. 9.....40c
Sheet Iron.—
No. 18 Am. Com.....4 00
No. 24 Am. Com.....4 20
No. 26 Am. Com.....4 40
No. 27, Am. Com.....4 60
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $5 00
" 21 to 24.....5 20
" 25 & 26.....5 40
" 21 to 24 Char'l..6 70
" 25 & 26 " ..6 90
RUSSIA.
Genuine.....17c
Imitation.....14c

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For supporting and locking upper and lower sashes of all windows. Not a coiled spring, but one *forged* from best materials. W. S. HAMMOND, Lewisberry, York Co., Pa.

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Lubricating Axles, as per, cut have proved superior to any other style: the continuous recess catches all foreign substances which may gather inside the box, and also serves as a receptacle for lubricating compound until drawn out by the attraction produced by the revolution of the wheel. It being placed in the central upper part of the axle, there is no possibility of small fragments working down the sides of the arm and grinding, as experiment has proved, occurs on axles made with detached recesses distributed over the upper surface of the arm. Springs all grades at lowest market prices.
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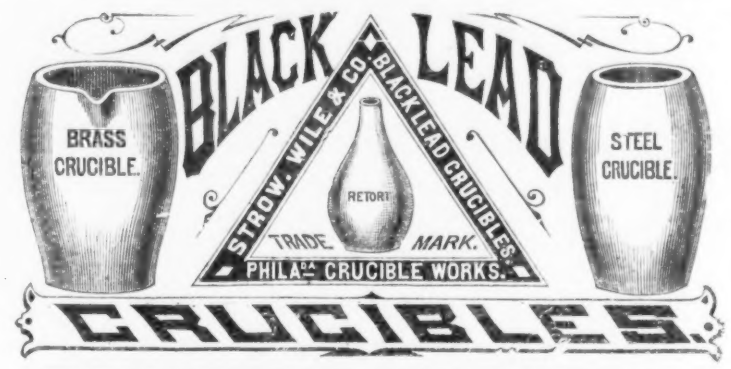

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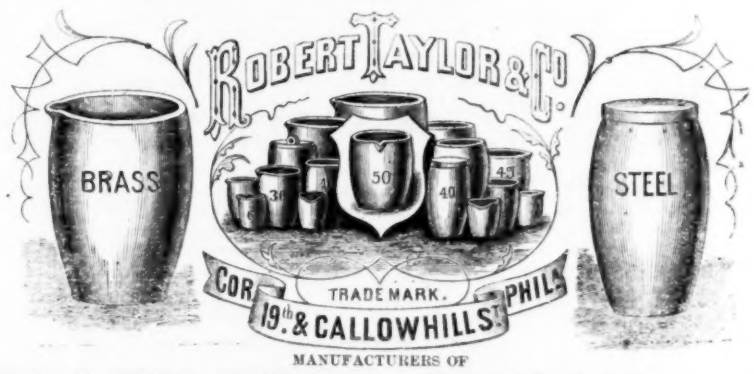

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Of all Sizes and Forms for melting
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Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.
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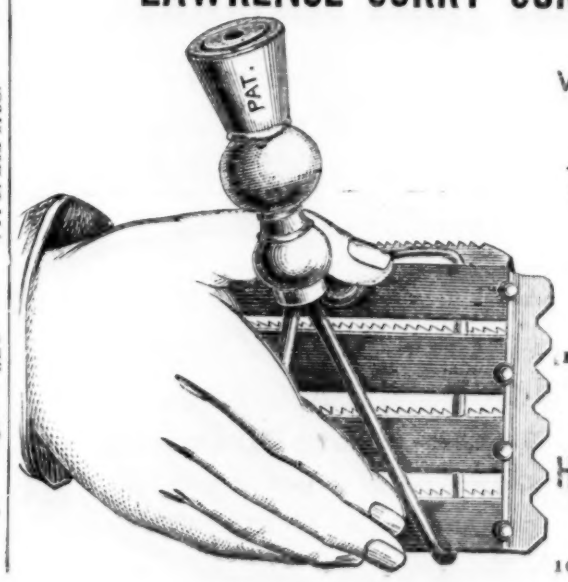

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The BEST, STRONGEST and Most DURABLE COMB Ever Made.
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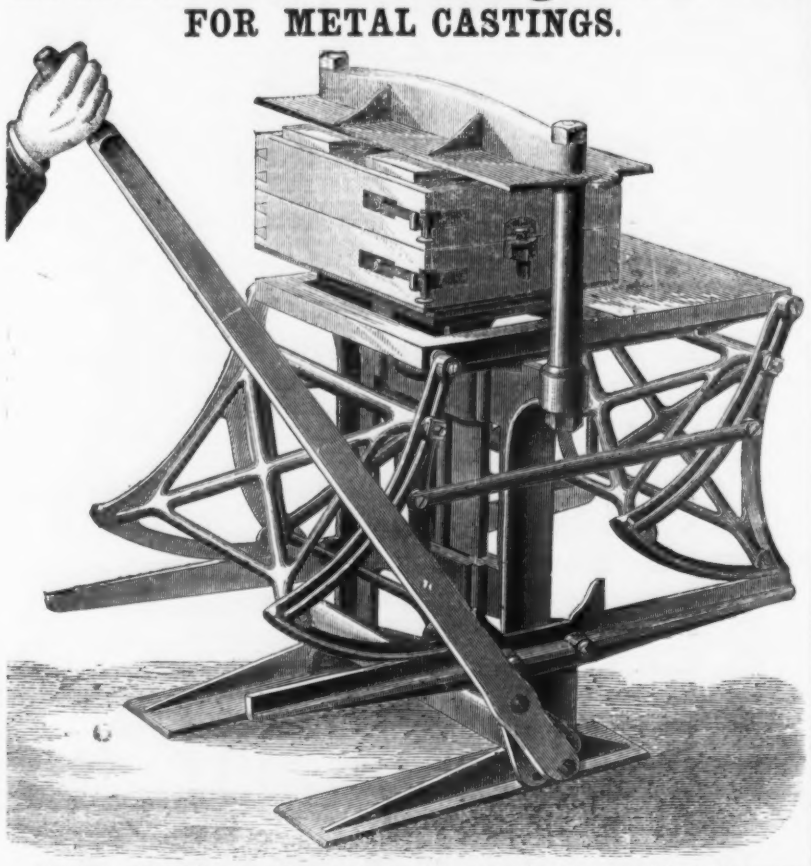
FOR METAL CASTINGS.



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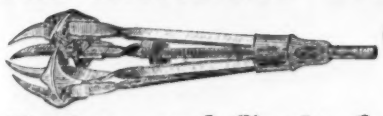

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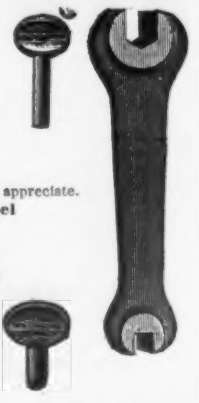

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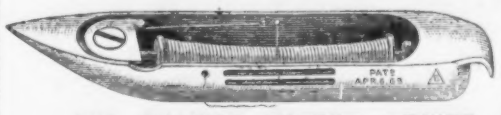

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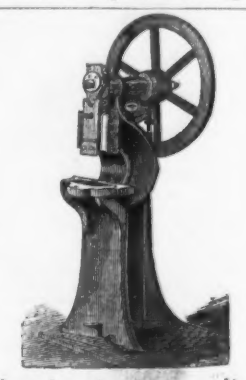

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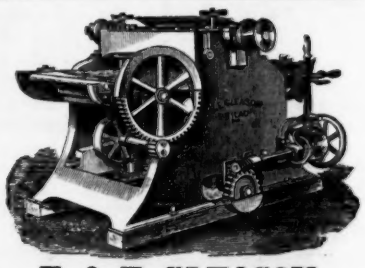

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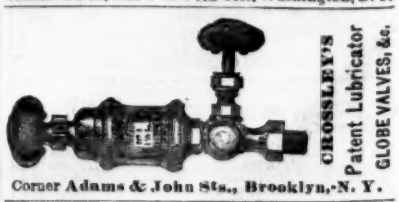

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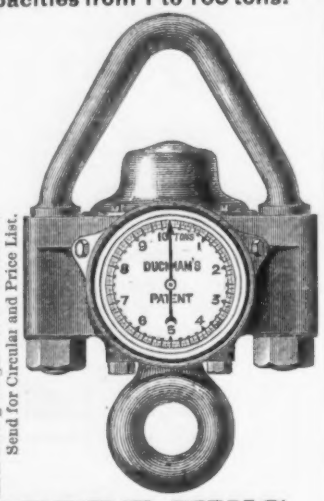

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These Motors are adapted to running light machinery, such as Coffee Mills, Printing Presses, Lathes, Drug Mills, Church Organs, Sausage Cutters, Ice Cream Freezers, Elevators, Hoisting Machines and everything requiring similar power, in cities or towns where there are Water Works.

And the best "Motor" in the world for family sewing machines. Send for Circular.

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Manufactured by CRANE BROS. MFG. CO., Chicago.

BARR'S ELLIPTIC Steam Trap

THE BEST IN THE WORLD

SEND FOR A CIRCULAR.

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5th St, below Columbia Ave., Philadelphia

SUPPLIES

FOR

Railways, Machinists and Amateurs,

Gum and Leather Belting, Packings and Cotton Waste, Babbit Metal.

FINE TOOLS

for Machinists and Amateurs; Barnes' Foot Power Scroll Saw; Foot Lathes all kinds. Sole Agents Baxter Steam Engine. Iron and Wood Working Machinery. Send for Price Lists.

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Lester Oil Co.,

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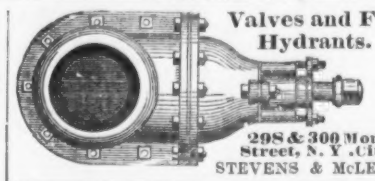
Exclusive manufacturers of the Renowned

Synovial Lubricating OILS.

The most Durable, Reliable & Economical Lubricant in existence;

Applicable to every grade of machinery. Send for Circular and Price List.



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Boilers Measured & Estimates Furnished.

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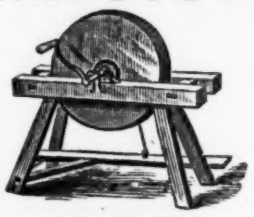

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Keep constantly on hand everything pertaining to the USE OF EMERY.

Automatic Knife Grinders.

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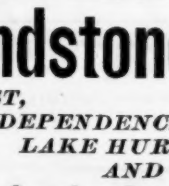

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Soapstone Register Borders.

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UNION STONE CO.,

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And Shaped Diamond Carbon Points, indispensable for Turning Emery Wheels, Grindstones, also Truing up hardened Steel and Paper Calender Rollers, &c. Address, J. DICKINSON, Patentee, *64 Nassau Street, New York.*

BUFFALO

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ESTABLISHED 1852.

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SASH, BLINDS, DOORS,

Cisterns, Tanks, Stairs, Hand Rails, Newels, Mirror Frames, Mantels, Curtain Cornices, Book Cases, Veneered Doors, Mouldings, and complete interior and exterior finish for houses.

ROUGH AND PLANED LUMBER,

Flooring, Siding, Shingles, Lath and Fence Posts.

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FOSTER & JAMIESON,

Manufacturers of

The Jamieson Patent Steam Pump,

and

Foster's "Excelsior" Rotary Pumps.

No. 13 Adams Street, Brooklyn, N. Y.

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Augers.—Watrous Ship.....dis 10 %
L'Hommedieu Ship.....dis 15 %
Axes.—Forester's Favorite, Bronzed.....$11 50
Blue Jackets, blue.....11 00
Excelsior, Black.....10 50
Chopper's Pride, Bronzed.....10 50
Red Cross, Red.....9 00
Red Cross, Handled.....12 00
Boy's Handled Blue Jackets.....11 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ₩ doz
Bells, Sleigh—
Fancy Body, Patent Leather, Cloth Bound, White Metal, 30, No. 1.....$1·70
Fancy Body, Patent Leather, Leather Bound, White Metal, 36, No. 1.....1·80
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 30, No. 1.....·38
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1.....2·50
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 30, No. 1.....3·38
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 36, No. 1.....3·50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1.....per pair, 50c.
Common, 6, No. 1.....45c.
Blind Hinges.—
Orr or Washburn's.....per hundred set $6 00
Bolts.—Carriage, Phila., "Girard Works.....dis 50&10 %
Borax.—Best Refined.....₩ ℔ 15c
Borers.—Angle, Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 75
Common, Snell's quality.....each 3 75
Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 50 %
Amidon.....dis 50 %
Brackets.—Star Bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. F. & C.....dis 25&10 %
Butts.—Union Drilled Loose Joint.....dis 45&10 %
" " Wire Fast Joint.....dis 25&10 %
" " Acorn Loose Joint...dis 45&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....revised list, dis 30 %
Wrought Narrow Butts.....reduced, dis 30 %
Can Openers—Sprague's.....dis 50 %
No. 1, Iron Handle.....$4·00
No. 2, Wood Handle.....4·50
Cards.—
Curry Cards, No. X, per doz., $0·75.....dis 30 %
Horse " No. X, " 0·80.....dis 30 %
Wool " No. 8X, " 2·50.....dis 15 %
Cotton " No. 10, " 3·50.....dis 10 %
Cartridges.—U. S. Cartridge Co.....dis 60 %
Chisels.—"Buck Bros." Shar'k Goods.....add 22½ %
Socket.....add 25 %
Churns.—Lightning—
Redheffer patent.....3 4 5 6 gall
per doz $22 00 $27 00 $31 50 $36 00
Coal Hods......dis 40 %
Fancy Japanned, No. 4, 15 in., $8·00; 5, 16 in., $9·00; 6, 17 in., $10·00.
Fancy Galvanized, No. 4, 15 in., $11·50; 5, 16 in., $12·00; 6, 17 in., $14·00.
Perfection, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Perfection, Galv'd, No. 4, 15 in., $15·00; 5, 16 in., $16·00; 6, 17 in., $17·00.
Morning Glory, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.
Morning Glory, Galv'd, No. 4, 15 in., $15·00; No. 5, 16 in., $16·00; No. 6, 17 in., $17·00.
Compasses and Dividers.—Bemis'.....dis 40 %
P. S. & W.....dis 30 %
Cordage.—Manilla (usual trade dis.).....₩ ℔, 14½c
American Tarred Hemp Lath Yarn.....₩ ℔, 10c
Corn Hooks.....per doz $2·75
Cow Ties.....dis 10 %
No. 30, Open Ring, 3 foot, No. 6, with Toggle.....$3·70
No. 35, " 3 " No. 6, " Snap.....3·90
No. 40, " 3½ " No. 6, " Toggle.....4·00
No. 45, " 3½ " No. 6, " Snap.....4·20
No. 50, " 4 " No. 5, " Toggle.....4·70
No. 55, " 4 " No. 5, " Snap.....4·80
No. 60, " 4½ " No. 4, " Toggle.....5·20
No. 65, " 4½ " No. 4, " Snap.....5·40
Crow Bars.—Iron. Steel Points.....₩ ℔, 5½c
" Sweet" Steel Bars.....₩ ℔ 11c
Brown's Steel Bars.....₩ ℔ 10c
R. P. & Co. Extra Drill Steel.....₩ ℔ 15c
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00.....dis 25 %
No. 8, " outside " $18·00.....dis 25 %
Torrey's.....$3·00
Gem.....1, $3·50; 2, $2·50; 3, $2·00 ₩ doz
Egg Beaters.—Lightning, Redheffer pat., pints, $5·50; 1 qt., $8·00; 4 qts., $12·00 per doz.
Emery.—Alden.....₩ ℔ 6½c
Wellington Mills.....₩ ℔ 10c
Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, less 15 %
Nicholson.....new net list
Wheeler, Madden & Clemson.....15 to £
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62½, 4, $1·88; 4½, $2·18; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
6, 7 inch. 5½ 6, 7 inch.
Deep Flange.—$3·50 3·75 4·00
5, 5½, 6 inch.
Hammers.—Maydole.....dis 12 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $10·75
" " " " " bell face, No. 1, $11; 1½, $9·75.
Hangers & Rollers.—Novelty.....dis 30 %
Anti-Friction.....$3 75 per pair—dis 30 %
Hatchets.—Underhill Edge Tool Co.....dis 25 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, $5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad....0, $5·25; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75
Hinges.—Strap and T, Stanley Works.....dis 40 %
Plate, Loose and Fast Joint.....₩ ℔ 6c
Wrought Screw Hook.....₩ ℔ 6½c
Knobs.—Young's imp. Silvered Glass.....dis 45 %
Lanterns.—Tubular No. 0.....$ 9·50
Guarded, No. 74, (with kerosene oil and candle burners).....5·50
Anti-Tubular.....8·00
Lead.—Sheet, 9½c.; Pipe, 9c.....less 10 %
Locks.—Norwalk Lock Co.....reduced list, dis 40&5 %
Mattocks.—
K. P. & Co., axe finish, long cutter.....$13 00—net
Short cutter.....12 75—net
Meat Cutters.—"Miles's" Challenge.....dis. 20 %
No. 1, $22·00; 2, $30·00; 3, $40·00.
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₩ ℔
Nails.—10d and larger.....$3 25 net
Nail Pullers.—Little Giant—Small.....per doz., $22·00
Little Giant—Large....." 30·00
Padlocks.—Wilcox.....reduced list, dis 40&5 %
All Brass, 2½ inch, 2 keys, job lot.....$9 00
Paper.—Tar'd Sheathing.....₩ ℔ 2 c
Dry Sheathing....." 2 c
" " "Beaver Brand" Rosin Sized.." 3½c
Tar'd " " " " 3 c
Felt " " " " 4½c
Virginia Cane Fibre.....4½c
Picks.—h. P. & Co., Solid Eyes.....5 to 6 6 to 7
$9 00 $9 50
Pins.—Universal Hat and Coat all wood—
2 in.....₩ gross $2·50; 3 in., 3·50; 4 in., 4·50—dis 15 %
Potato Diggers.—
"Partridge," 6 square tine.....₩ doz $12 00
Shumway & Co., 6 round tine.....₩ doz 9 00
Pulleys.—Axle.
Frame Pol. Wheel....No. 150, 90c., 1¼ in.; 16, 58c., 2 in.
Common Axle.....No. 18, 34c., 1¼ in.; 26, 40c., 2 in.
Milled Axle.....No. 2, 42c., 1¼ in.; 3, 50c., 2 in.
Nashua Pat. Axle Bronzed Face...1¼ in., 80c.; 2 in., 90c
Cast Steel Axle.....2 in., $1·00
Pulley Blocks.—"Best Boston Make".....net
Common Strapped Blocks—
4 5 6 7 inch.
Single, 75c. 85c. $1·00 $1·13 each.
Double, $1·00 1·12 1·25 1·60 "
Inside Iron Strapped Blocks—
5 6 7 to inch.
Single, $1·00 1·13 1·38 2·00 2·25 2·75 each.
Double, 1·88 2·00 2·63 3·63 4·00 5·00 "
Inside Iron Strapped Blocks, with Patent Roller Bushings—
5 6 7 8 9 10 inch.
Single, $1·25 1·50 1·65 2·50 2·75 3·50 each.
Double, 2·50 3·00 3·38 4·63 5·00 6·50 "
Plated Ware.—Rogers Bros.....dis 50 %
Plumb & Levels.—"Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels.....dis 50 %
No. 2, First Quality Levels.....dis 60&10 %
No. 3, Iron Pocket " .....dis 35 %
No. 4, Level and Plumb Glasses.....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge.....dis 50&10 %
No. 6, Improved Iron Bench Planes.....dis 20&10 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....new net list
Rail Barn Door.—For Novelty and Anti-friction Hangers.....per foot 7c., dis 30 %
Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8, dis 7½ %
13 13 14 14 15 16c ₩ ℔
Rubber Moldings.—"Harmon's".....dis 10 %
No. 2, for Windows.....per foot, 5c
No. 3, for Doors.....per foot, 10c
No. 4, " .....per foot, 12c
Sad Irons.—Bliss & Drake.....₩ ℔ 4c
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75.....dis 10 %
Saws.—*Hand and Panel*—
Wheeler, Madden & Clemson's, same list as "Diston's".....dis. 15&5 %
Disston's.....dis. 12½ %
Cross Cut—
Wheeler, Madden & Clemson X Cuts.....per ft., 37c
" " " "Star" X Cuts. " 60c
" " " Champion X Cut. " 50c
" " " One Man X Cut..each, $2·25
Boynton's genuine Lightning X Cut.....per ft., 50c
" " " One Man X Cut..each, $2·00
Circular—Wheeler, Madden & Clemson's.....dis. 25 %
Mill— " " " .....dis. 25 %
Screws.—Am. Screw Co., new list Sept. 1st.....dis 30 %
Aiken's.....dis 30 %
Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6·50
second quality....." 2·00
Shovels.—O. Ames.....dis 20 %
M. B. & D.....dis 20 %
Snow, Malleable Iron Tip, D Handle—Agents for New England.....$6·50
Snow, Malleable Iron Tip, long Handle—Agents for New England.....5·50
Sifters.—Coal, Rice, &c.....$12 00
Spading Forks.—M. & E.....dis 25 %
Stone Pickers.—"Partridge," original...₩ doz $15 00
Tools.—Aiken's Pattern, 40 in set; Parr's...$7 5 per doz
Traps.—Oneida.....dis 25 %
Blake's.....dis 50 %
Vises.—B. P. & Co.'s Solid Box, Blacksmith.....₩ ℔ 12c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 20 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weather Strips.—"Harmon's".....per doz 35, dis 10 %
Weights.—Window Weights.....₩ ℔ 2c
Wedges—Axe.....₩ doz 38c
Wire.—
Eureka, in spools, No. 28 to 40 assorted...₩ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black.....₩ ft 5½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&5 %
Walton.....dis 50 %
Wringers.—
Novelty and Universal } Tub No. 2 } Less than 2 doz, $72 00; 2 doz or more, 70 00
Bench A... less than 2 doz $86 00; 2 doz or more $84 00
" B... " " 94 00 " " 92 00
" C... " " 110 00 " " 107 00
Eureka..... " " 60 00 " " 58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c.....dis 33½ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)

September 1, 1875.

Iron.—Best Refined Bar Iron.....₩ ton $57 50
"Burden Best" " 95 00
Swedish Bar Iron.....gold " 110 00
Norway Shapes.....gold " 122 50
Norway Nail Rods.....gold " 130 00
Sheet Iron, American.....₩ ℔ 4½c
" " Galvanized....." 9 c
" " Russian.....gold " 13½c
Plate Iron, C. No. 1....." 3½c
Iron Rails.....₩ ton $50 00
Steel Rails....." 75 00
Pig Iron, Foundry, No. 1 extra....." $27 00
" " No. 2 extra....." 25 00
" Gray Forge....." 23 00
" Scotch....." 30 00 @ 32 00
Wrought Scrap Iron....." 31 00
Old Rails....." 28 00
Steel.—₩ ℔ German.....₩ ℔ 9½c
Eng. Tool, gold 15½c Spring.....8 c
American Tool 14½c Tire.....6 c
" Mach 9½c Sleigh Shoe.....4½c
Bessemer.....7 c Toe Calk.....7½c
Tin Plates.—₩ box gold ₩ ℔
I. C. Char. 10x14.....$7·75 **Copper.**—
I. C. Coke 10x14.....7 00 Ingot.....23½c
Char. Roof, IC. 14x20, 7 25 Bolt.....30c
Coke " IC. 14x20, 6 25 Sheathing.....30c
METALS. **Lead.**—₩ ℔
Pig Tin.—₩ ℔., gold Pig.....7½c
Banca.....21c Sheet & Pipe.....8 1-10c
Straits.....19½c **Zinc.**—Sheet..₩ ℔ 10½c
English.....19½c **Spelter.**.....₩ ℔ 7½c
Antimony, gold ₩ ℔ 13½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror.....₩ doz. $1 75
Hudson's Rotary.....7 75
Axes.—Wm. Mann's, Red Warrior.....₩ doz. $11 50
Wm. Mann's, W. Stewart's.....11 00
" C Marshall.....10 50
" Handled.....$5 extra
" Double Bitted.....2 50
H. L. B. & Co.'s, L. & Co.....11 50
" Pioneer.....12 00
" James & Co.....11 00
Hunt's.....12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles.....dis 10 & 5 %
Common Axles (Pat. Lubricating), 1¼ inch and upward.....₩ ℔, 6½c.
do. less than 1¼ inch.....7 c.
Bellows.—Best St. Louis make...60c ₩ in. dis 20&2½ %
Bells.—Troy, Church, School and Farm Bells..₩ ℔ 40c
"Improved Amalgam Bronzed," 15 in., $3·00; 17 in., $4·00; 19 in., $6·00.....net
Belting.—"Boston Belting Co.'s Rubber.....dis 40 %
"Bradford & Sharp's" Oak-Tanned Leather.....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire...dis 70&10 %
Arms, Bell & Co.'s Machine.....dis 30&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 25&10 %
Broad Fast Joint.....dis 8 &10 %
" Loose " .....dis 45&10 %
Reversible.....dis 40&10 %
" Japanned and Silver Tipped.....dis 45&10 %
Loose Joint "Acorn".....dis 45&10 %
Wheeling Hinge Co.'s W't Fast Joint Nar...dis 30 %
" " Broad.....dis 35 %
" " Loose Joint.....dis 35 %
" " Reversible.....dis 35 %
" " Table & B'k Flaps.....30 %
Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50.....dis 25 %
Cider Mills.—
American Senior, $40·00; Am. Junior, $25·00....dis 20 %
Corn Knives.—Dunn Edge Tool Co.'s Clip...₩ doz 5 00
Seymour Mfg. Co.'s solid Steel Back.....4 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Cotton Gins.—The Carver, 10 in. Saw, $4 a Saw..dis 15 %
12 in. Saw, $4·50 a Saw.....dis 10 %
Crow Bars.—Steel Pointed.....₩ ℔ 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw.....dis 10 %
Robinson's Patent Sweepstakes Drag Saw....dis 10

Fanning Mills.—Nash & Cutt's.....dis 20 %
Feed Cutters.—Improved Burdick National...dis 20 %
Sanford No. 1, $10 75; No. 2, $8 00.....net
Files.—Black Diamond, Mill.....$5·00 £ currency.
" Bastard.....5·00 £ currency.
" Taper.....5·00 £ currency.
Forges.—Keystone Portable Forge Co.'s.....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 10 %
" " Handled Hoes.....dis 30 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....dis 5 %
" Planet Drill, Nos. 2 and 3.....dis 15 %
" Combined Drill and Wheel Hoe.....dis 15 %
Grinding Mills.—Challenge Feed Mills.....dis 15 %
Sedgebeer's Nonpareil Mills.....dis 15 %
Hammers.—Masons' Hammers.....₩ ℔ 20c
Smiths' Hand.....20c
Handles.—No. 1 Fork, Hoe and Rake.....dis 20 %
No. 2 Fork, Hoe and Rake.....dis 40 %
Harrow Teeth.—1 inch iron.....₩ ℔ 4½c
⅞ and ¾ inch iron.....4¾c
Barbed or Headed.....½c extra
Hay and Cotton Presses.—
Dederick's Railroad.....net list
" Perpetual.....net list
Hay Knives.—
Dunn Edge Tool Co.'s.....₩ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent).....₩ doz $30 50
Hinges—
Wheeling Hinge Co.'s Strap & T.....dis 33⅓&10 %
Horse Hay Forks.—Nellis' Harpoon.....dis 25 %
Horse Nails.—National Patent Pointed.....20c rates
National Patent Pointed, extra finished.....22c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Horse Rasps.—Heller Bros.....dis 45 %
"Black Diamond".....$8·00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern).....₩ keg, $5 50
" Mule....." 6 30
" Trotting Shoes....." 6 00
Tredegar Horse.....per keg $5 50
" Mule.....per keg 6·30
Hose.—
Boston Belting Co.'s Rubber Medium Sizes, dis 30&10 %
" " " Small Sizes, Hydrant.....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws.....new list net
W. T. Wood & Co.'s Chest Hatchets.....new list net
" " Axes.....new list net
" " Loading Tongs.....new list net
" " Medium, Small and Family Tongs.....new list net
" " Chisels, Hooks and Grapples.....new list ne
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks...₩ doz $13 00 @ 18
" " Grub Hoes, oval eye.....10 00 @ 14 50
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $40·00 net
Nails.—Wheeling.....$5 15 rates
Packing.—Boston Belting Co.'s Rubber, Plain...dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 2 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co.'s Railroad and Clay.....₩ doz $9 30 @ 11 00
Klein, Logan & Co.'s Coal.....7 45 @ 8 40
" " Pick.....12 00 @ 15 00
" " Stone.....14 40 @ 14 90
" " Tamping.....14 75 @ 15 35
" " Miners' Drifting.....10 25 @ 12 80
Plows.—Avery's Cast and Steel.....dis 20 %
Collins Cast Cast Steel.....new list net
Pekin Steel.....new list net
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $25; No. 3, $22.....dis 30%
Pulleys.—5 inch.....per doz $4·25 net
4 inch.....per doz 3·25 net
Nellis' Patent.....new list dis 15 %
Pumps.—
St. Louis, Farm, Patent Metal Lined...new list dis 50 %
Rakes.—Paddock's Premium Sulky.....$38 00 net
St. Louis Revolving 14 tooth.....4 65 net
" " 16 " .....4 90 net
" Hand Hay Rake.....dis 20 %
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 25 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....dis 45 %
Cast Iron.....dis 10&5 %
Sad Irons.—Monitor Brand, Silver Polished...₩ ℔ 4½c
Sash Weights.—Standard Solid Eyes.....₩ ℔ 4c
Saws.—Curtis & Co.....dis 10 %
Scythes.—Dunn Edge Tool Co.'s...new list dis 20&5 %
Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7·00
Extra Indian Pond. " 7·50
Premium " 10·50
Diamond Grit. " 13·00
Shovels and Spades.—H. M. Myers & Co.....dis 30 %
O. Ames & Son.....dis 30 %
Grain Scoops, Par. Cor'd straps H. M. M. & Co...dis 30 %
" " " M. Howland & Co.dis 30 %
" " " O. Ames & Son..dis 30 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Pollers.....1 ₩ ℔ 15c
Solid Cast Steel....." 25c
Spaths and Cradles.—Seymour Mfg. Co.'s...dis 20 %
Sorghum Machinery.—Bell Cane Mills.....dis 15 %
Scantlin's Seamless Evaporators.....dis 10 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 12½ %
Blue Seat Springs.....dis 15 %
Vises.—Solid Box.....₩ ℔ 16c
Wilson Mfg. Co.'s.....dis 15 %
Wheelbarrows.—Railroad & Garden.....new list net
Wrenches.—Coes' Genuine.....dis 33⅓ %
Coes' Pattern.....dis 50
Wagons.—Whitewater Farm Wagons—
Thimble Skein.....No. 2, $14; 3¼, $78; 3½, $79
Iron Axle.....No. 1¼, $75; 1½, $81; 1¾, $86

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 9·50	IX, 14x20, Roofing	$11·50
IX, 10x14, "	12·00	IC, 20x28, "	19·00
IC, 12x12, "	10·00	IX, 20x28, "	22·50
IX, 12x12, "	12·50	IC, 10x14, Coke	$9·00 @ 9·00
IC, 14x20, "	10·00	IC, 14x20, "	9·00
IX, 14x20, "	13·00	IC, 10x20, "	14·00
IC, 14x20, Roofing	9·00		

Usual difference for odd sizes.

Block Tin.

Large Pigs.....25c | Bars.....27c
Small " L. & F.....26c |

Sheet Zinc.

Casks.....₩ ℔ 10½c | Sheet.....₩ ℔ 11c

Solder.

No. 1, Refined, in bars or plate.....16c
No. 2, " " " 15c
Pig Lead.....7½c

Sheet Copper.—14 to 100 lbs. Sheets 30x72.....31c
10 to 12 lbs., " and 40x72.....32c
6 to 9 lbs., " " 33c
Tinned, 14 and 16 oz. 14x48.....32c
Planished, 14 and 16 oz. 14x48.....39c
" No. 7, 8 and 9.....41c
Copper Bottoms.....34c

Sheet Iron

	Com'n.	Sm'th.	Char'l.	Juniata
No. 16 to 20	4½c	4½c	6½c	7½c
No. 22 to 24	4½c	4½c	6½c	7½c
No. 26	4½c	5 c	6½c	8 c
No. 27	4½c	5½c	6½c	8½c

Galvanized Iron.....dis 30 %
Iron Rivets.....dis 25 %
Iron Wire.....dis 35 %
Coppered Pail Bail Wire.....dis 20 %
Copper Rivets and Burs.....dis 20 %
Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12.....per lb. 17c
Stained—No. 9, 10, 11, 12.....per lb. 16c
Tare 22 lbs to Bdle. For less than 1 Bdle. add 1c. ₩ ℔.
Refined Sheared Spring Steel.....dis 20 %

CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

September 10, 1875.

Tin Plate.—

	14x20,	IX, Ch'l	Best.
10x14, IC, Ch'l, Good A			$13 00
10x14, IC, " Best.	9 50		15 50
10x14 IX, " "		12 00	14 00
12x12, IC, " "		10 00	12 00
12x12, IX, " "		12 50	14 50
14x20, IC, " "		10 00	17 00
Roofing IC, Charcoal, Best			9 00
Roofing IX, Charcoal "			11 50
20x28, IC, Charcoal Roofing, Com			15 00
20x28, IC, " Good			18 50
20x28, IC, " Best			19 00
20x28, IX, "			23 50
10x14, IC, Coke Plates			8 50 to 8 75
14x20, IC, "			9 00 to 9 50
10x20, IC, "			14 00

Block Tin.—

Large Pigs.....27c | Bars.....29c
Small " .....28c |

Zinc.—Sheet, 500 to 1000 lb. Casks.....10½c
Loose Sheets.....11c
Slab Zinc or Spelter.....7½c

Copper.—Bottoms.....34c
Sheathing.....32c
Planished.....39c
" Boiler lengths.....41c
Ingot.....—
Bolt.....33c

Bruzier's Sheets.—
30x60, 6 & 7 lbs.....₩ ℔ 29c | 30x60, 10 & 12 lbs...₩ ℔ 25c
30x60, 8 & 9 lbs....." 27c | 30x60, 15 to 100 lbs. " 32c

Solder.—F. S. & Co.'s make.
Best Fine.....30c
No. 1.....29c
Roofing.....17c
Braziers' or Soldier Solder.....25c
Antimony.....15c
Babbit Metal—F. S. & Co.'s.....16c
No. 2.....14c

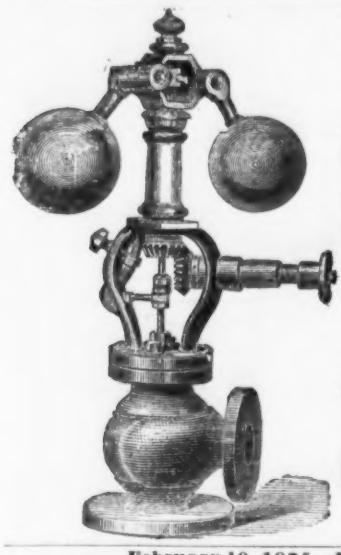
Sheet Iron.—

	Common.	Smooth Com.	Smooth Charcoal.	Smooth Juniata
No. 24	4½c	5½c	6½c	8½c
25 & 26	4½c	5½c	7 c	9 c
27	4½c	6 c	7½c	9½c

Galvanized Iron.....dis 30 %

No. 16 to 20	13c	No. 24	15c
21 to 24	13c	26	16c
25 & 26	14c		

Russia Iron.—
Perfect.....17c | No. 1 Stained.....16c
" In Sheets, 1c



TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR,

AND

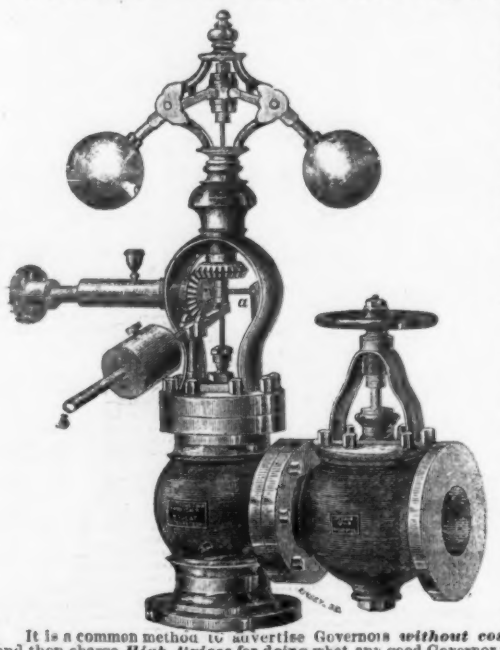
Buoy's Patent Counter Scale,

No Nest of Weights.

Circulars sent free

February 10, 1875. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
⅜	18·00	20·00	17·00	..	..
½	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·64
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00	No Larger Portable made than 2½ in.	3·75	19·00
3	62·00	70·00		4·25	22·00
3¼	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	33·00
4½	91·00	103·00		5·50	37·00
5	102·00	114·00		6·00	42·00
5½	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·00	83·00
9	230·00	255·00		10·00	..

No Charge for Boxing & Cartage.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

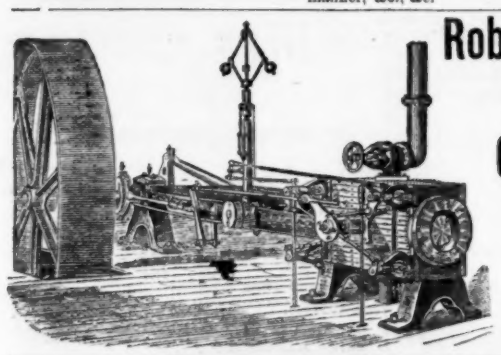
The Pratt & Whitney Co.,

Hartford, Conn.,

Have constantly on hand and making

Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



Robt. Wetherill & Co

CHESTER, PA.

Corliss Engine BUILDERS

AND

Boiler Makers.

THORNE, DeHAVEN & CO.

21st Street, above Market, PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

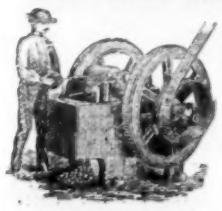
HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

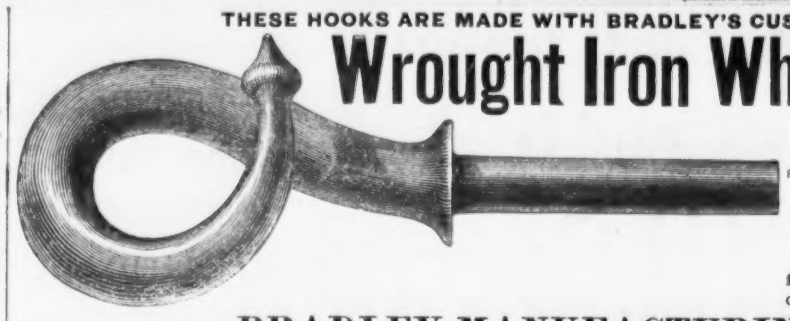
Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

THESE HOOKS ARE MADE WITH BRADLEY'S CUSHIONED HAMMER.

Wrought Iron Whiffletree Hooks.



We are ready to fill orders for Manufacturers or Dealers, and will quote the above Hooks, made of

BEST AMERICAN REFINED IRON,

At 10 cents per lb. Net cash.

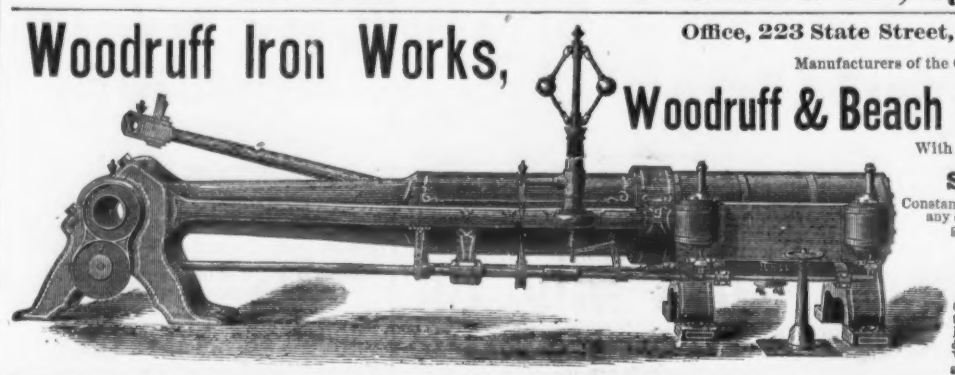
Hooks will count out about four to a pound. We can furnish them any desired length of shank and in any quantity.

BRADLEY MANUFACTURING CO., Syracuse, N. Y.

Woodruff Iron Works,

Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated



Woodruff & Beach Steam Engine,

With recent valuable improvements.

Steam Boilers

Constantly on hand and made to order any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style. Direct all letters to **The Woodruff Iron Works, Hartford, Conn.,** as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

Knowles Patent Steam Pumps

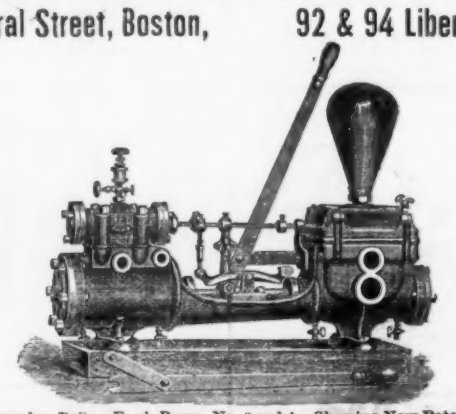
MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.



Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

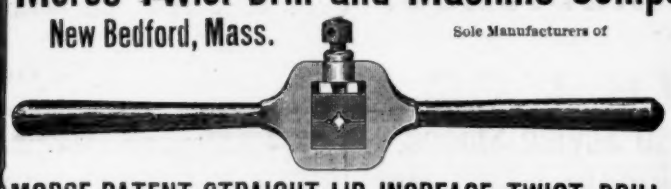
Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

Morse Twist Drill and Machine Company,

New Bedford, Mass.

Sole Manufacturers of



MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.

Beach's Patent Self-Centering Chuck.

Also Manufacture **Patent Taps and Dies, Patent Screw Plates, Patent Tap Wrenches, Pipe Taps and Pipe Reamers, Gas Dies.**

SOLID AND SHELL REAMERS.

All Tools exact to Whitworth's Standard Gauge.

Drills made to fit any Socket desired.

EDWARD S. TABER, Treas.
GEO. R. STETSON, Supt.

Machinery without Lubricant

METALINE.

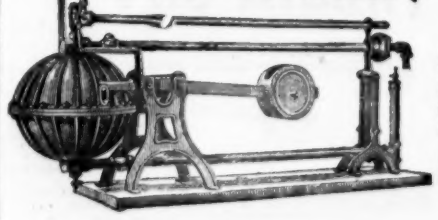
Machinery Metalined, or Metaline furnished to Machine Builders.

No oil or attention required. Runs with little or no wear. No dirt or danger from fire. No damage to goods in process of manufacture. Years in use by best concerns, who are refitting old, and ordering new machinery to be metalined.

AMERICAN METALINE COMPANY,

61 Warren Street, New York City.

The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,

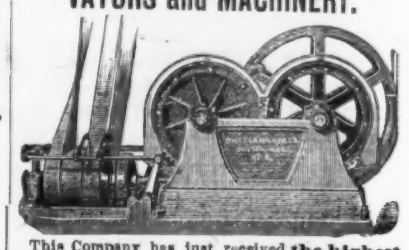
Albany, N. Y.

Whittier Machine Co.,

1176 Tremont St., Boston, Mass.

Manufacturers of

STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.



This Company has just received **the highest award, a Gold Medal, for Safety Elevators,** from the Massachusetts Charitable Mechanics Association.

CHARLES WHITTIER, Prest. JAMES STURGIS Treas.

The EDDY VALVE

All Brass or Iron Body, BRASS MOUNTED VALVE.

Made by the

MOHAWK & HUDSON MFG. CO.,

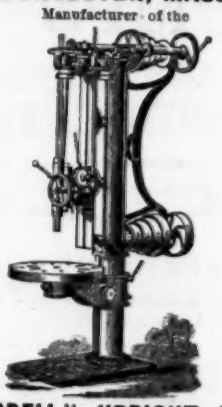
Waterford, N. Y.

Four miles from Troy, N. Y., by steam or horse cars.

P. BLAISDELL & CO.,

WORCESTER, MASS,

Manufacturer of the



"BLAISDELL" UPRIGHT DRILLS,

And other First-Class Machinists' Tools.

Patented Steam and Hydraulic, April 1, 1868.

EAGLE PACKING,

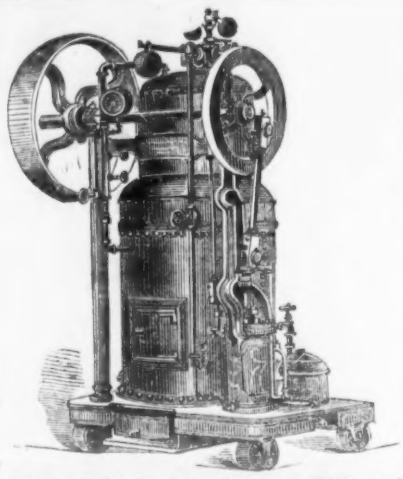
Of various sizes for **ENGINES and PUMPS** manufactured by JAMES GLANDING & CO., No. 115 Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing.

Machinery, &c.

THE

Shapley Engine

Patented Feb. 10, 1874.



COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.

$200·00.

Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS,
Binghamton Iron Works,
Binghamton, N. Y.

Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

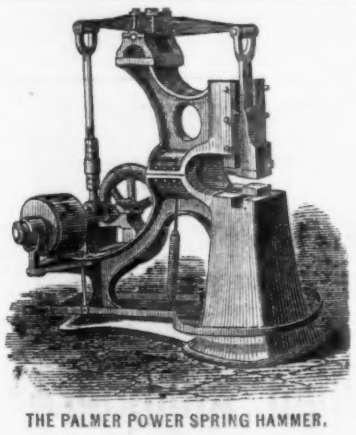
(Double and Single Gate, ¼ in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

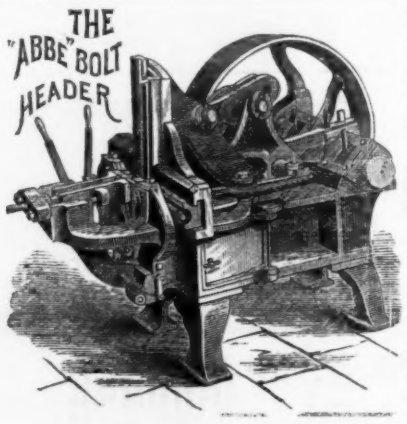
Cor. N. 15 St. & Pennsylvania Ave., Phila.

E. HARRINGTON & SON,
Manufacturers of
ENGINE LATHES,
From twelve (12) to forty-eight (48) inches swing;

Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press for Mandrels Grindstone Boxes.



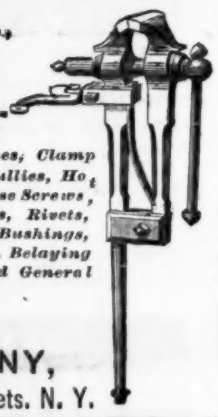
THE PALMER POWER SPRING HAMMER.



Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

S. C. FORSAITH & CO.,
Manchester. N. H.

WILSON MANUFACTURING COMPANY.,
NEW LONDON, CONN.
MANUFACTURERS OF
SOLID BOX VISES.



With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Sash Pullies, Hoe House Pullies, Composition Cocks, Bench Screws, Vise Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

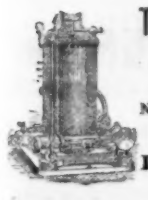
WILSON MFG. COMPANY,
Warehouse 97 Chambers and 81 Reade Streets. N. Y.

The Frazer Axle Grease and Lubricator.

A pure Lubricator, free from water, gum or sediment. The best article made for *Wagons, Open Journals, Cog Wheels Rollers* and wherever a *Solid Lubricator* or *Grease* can be applied. Put up in Boxes, Kegs and Barrels. For prices see New York Price List in this paper.
Established 10 years.

Frazer Lubricator Company,
104 Maiden Lane, New York.

IMPROVED
Engine Lathes
SCREW MACHINES, &c.
JONES, LAMSON & CO.,
Windsor, Vt.



The Whitmore Engine.
SAFEST, CHEAPEST & BEST.
Lovegrove & Co.,
No. 121 South Fourth Street,
PHILADELPHIA, PA.
Sole Manufacturers
Engines, Boilers and Steam Pumps.

The Hartford Foundry & Machine Co
Successors to the
Woodruff & Beach Iron Works,
HARTFORD, CONN.
J. S. Hunter, Prest. E. J. Murphy, Treas. & Sec.
High and Low Pressure Marine & Stationary
STEAM ENGINES AND BOILERS,
Mining, Powder & Paper Mill Machinery,
And every variety of Iron and Composition Castings made to order.

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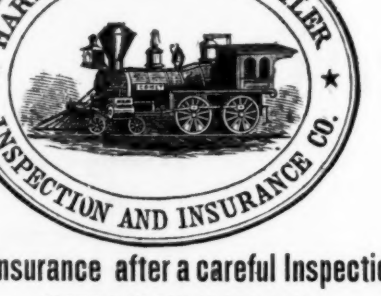

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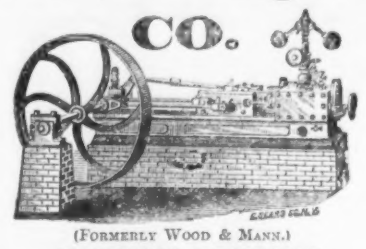

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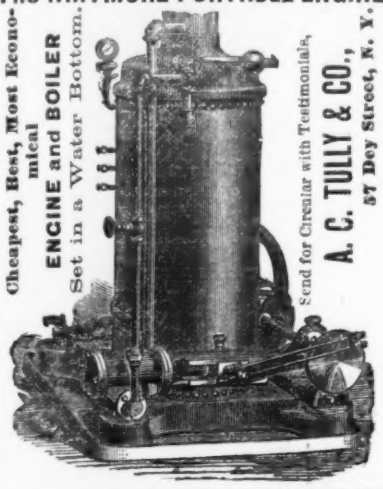
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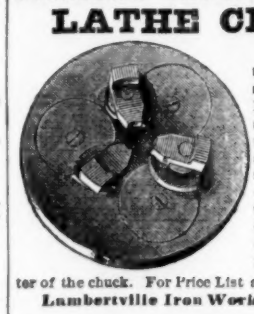

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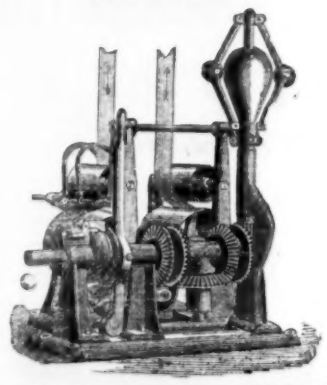

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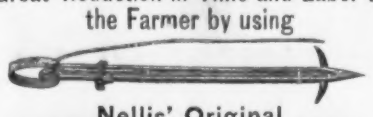

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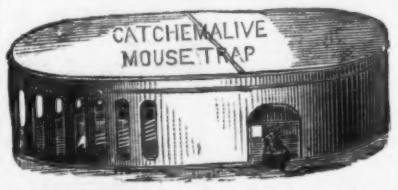

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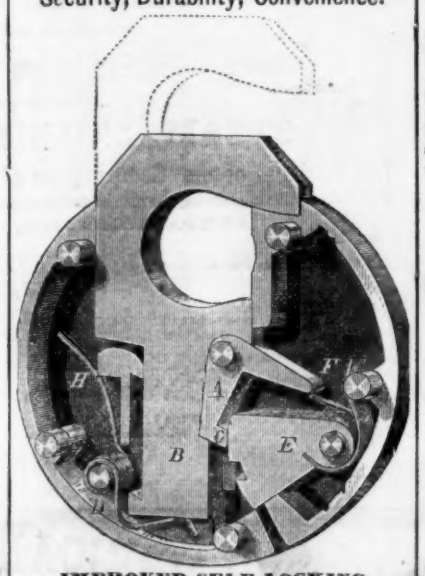

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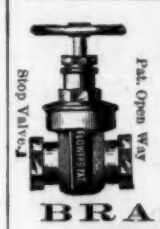

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